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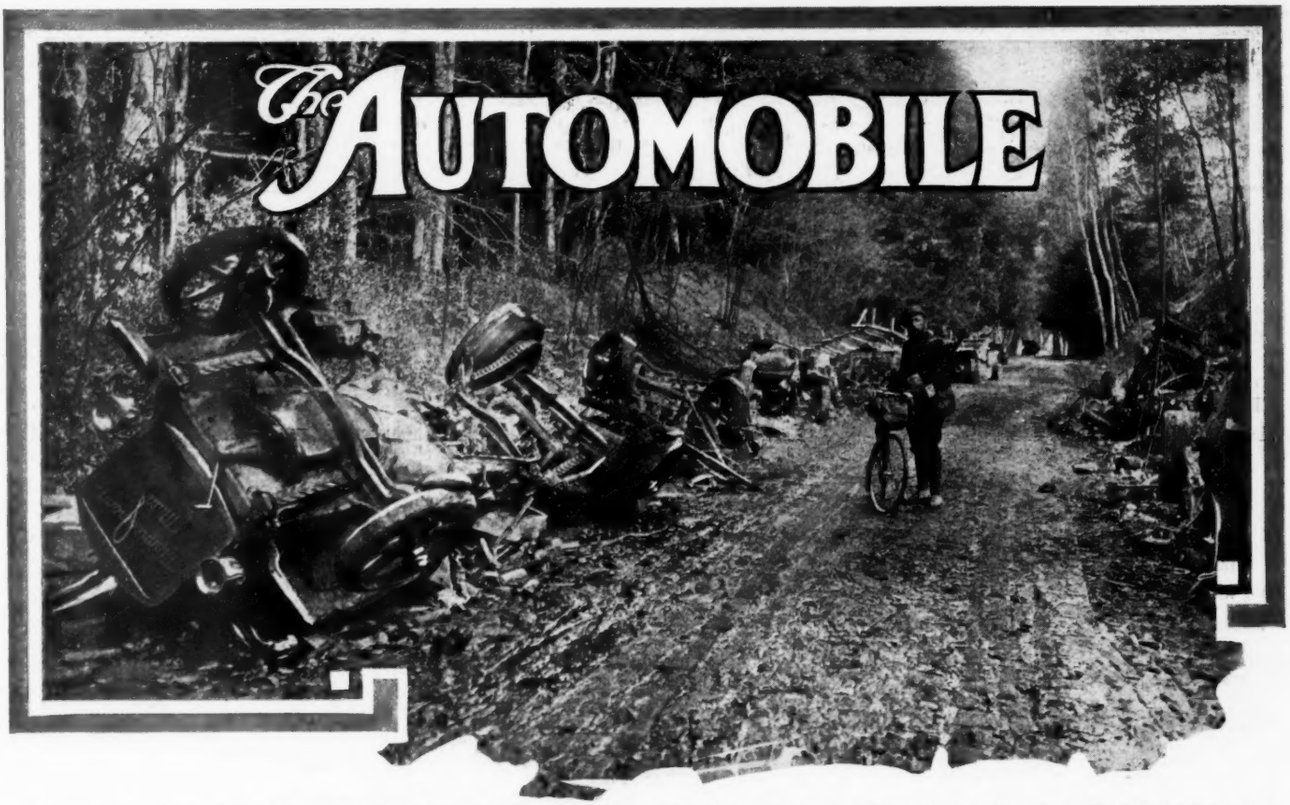



A German motor convoy attacked and destroyed by French troops in the forest of Villers-Cotteret. A rifle shot killed the driver of the first truck and it capsized and the rest of the vehicles were piled up behind it. Fire broke out and destroyed the entire fleet

# With a Car at the Front

## Tremendous Work Done by Cars and Motor Trucks in European War—Changing Tires Under Fire—A Night Dash Over Battlefields

By W. F. Bradley,
*Special Correspondent of* THE AUTOMOBILE *with the Allied Armies in France*

PARIS, Sept. 25—We speak and write of the importance of the role played by automobiles in this great war, but no man, who has not been on active service, can appreciate to the full the work done by mechanical transport. The opportunity presented itself to go on active service as a motor car driver, doing the same work as well-known race drivers and hundreds, indeed thousands of more humble motorists. I accepted this offer, and at the present moment am wearing the British uniform, driving officers from the base to army headquarters, from headquarters to the firing line—doing any kind of work which may be required. This is the story of a spell of service, a period in which days were lost count of, for the completion of the task and not the setting of the sun decided that rest should be taken.

### Officers Use Cars Only

I was given orders to report at the depot 6 miles away within half an hour. The first work was to carry officers in the district of Paris and to the army base. Officers never make use of the railway—unless they are prisoners. The only rapid means of locomotion is the automobile. The trip from Paris to the nearest point of the firing line can be made in 3 to 4 hours with a fast car. The average time on the train is from 20 to 23 hours.

While military men are making the greatest possible use of cars, civilians are being restricted to the utmost. Within the zone of the armies it is absolutely impossible for a civilian automobile to penetrate. Newspaper men in particular have made wily and determined efforts to break through, but without success. The seizure of the car and the return of the occupants on foot, escorted by gendarmes, effectively puts a stop to any such schemes.

The freedom of the main roads from all other kinds of traffic and the right of way which the military man enjoys make it possible to maintain a very high average rate of speed. A pace of 30 or 40 miles an hour can be set and maintained for hour after hour, the only necessity for slackening being on turns or when army convoys are met.

Right—M. Michelat, chief engineer of the Delage company, now serving as an automobile driver with the French army. His duty is driving officers to and from headquarters and to the firing line

Upper left—English motor truck passing through one of the Marne towns while the battle of the Marne was in progress

Lower left—A Delage car on the firing line. Note the German caps which the French soldiers have put on for a prank. The men are always ready for a bit of fun

After a full day's work in and around Paris, I was given the order to drive to the headquarters of the British army in the field. Paris is a fortified city, with gates closed and breastworks outside the gates. Civilians driving cars only get through with great difficulty; military cars have a right of way. Five miles from the city walls a deserted country is entered. All the troops are at the front and most of the civilians have fled. From time to time a wrecked automobile is seen by the roadside. When a machine breaks down under war conditions it has to be repaired on the spot or abandoned. There are no resources other than those possessed by the driver, and if he is unable to carry out the repair the best plan is to strip the chassis and leave it. It is almost painful to see high grade cars rotting and rusting by the roadside when a little unobtainable assistance could have saved them.

Most of the cars seen on the road are high-grade machines bearing all the evidences of hard and continuous work. In a little village where I was held up for a few seconds a handsome Rolls-Royce with a costly boat type body appeared. A German helmet was tied to the radiator cap, the body was thickly coated with mud and tied around the car were cans of gasoline and boxes with provisions.

### Truck in Artillery Zone

The battle of the Marne had come to a close about a week before I ran through this district. But all the ravages of war were to be seen. At the town of Meaux the half of a rickety bridge spanned the Marne. This point had been under heavy fire, for the houses at the approach to the bridge were in ruins, and an English motor truck, which had somehow or other got into the line of fire, was in such a condition that it was not even worth the attention of the junk dealer.

All the barges in the river at this point had been sunk. Between Meaux and Chateau-Thierry, about 40 miles up the river, not a single bridge has been left intact. At one of these towns on the River Marne the bridge has been blown up by the French at 2 p. m. At 2 o'clock the following morning German officers approached this bridge in a Benz limousine. Not knowing that it had been demolished, they rushed

across at high speed to fall to an instant death in the water.

After crossing the Marne at Meaux it was discovered that we could not get back to the north side without making a wide detour to Chateau-Thierry, a town famous years ago for its hill-climbing competitions. Consequently we swung round and recrossed the Meaux bridge, making a detour on the north bank to Chateau-Thierry. This brought us through a big portion of the Marne battlefield. All the dead and wounded men had been removed, but horses still lay in the fields and on the roadside.

But what most impressed one as a tourist was the utter untidiness of the whole countryside. One hill had been under heavy shell fire. Big trees had been cut through by shell, innumerable branches had been carried away, every telegraph pole was broken and telegraph wires hung straggling-ly. In the fields, where there were not actual signs of fighting thousands of cans and bottles lay around. There were spent shells, also unspent shells mounted in wicker baskets. In one field a big heap of soldiers' equipment was rotting under sun and rain. Hay ricks were untidy; fodder was scattered about the roadside; there were wrecked wagons in ditches. In place of the trim, grassy banks on each side of a well kept highway there was a bank of soft mud trampled by thousands of hoofs and shoes.

### The Wake of War

Between the Marne and the Aisne valleys is a 30 to 40-mile stretch of country through which the German armies made their retreat after the Marne battle. This was a deserted country, not destroyed, but scoured clean of food and fodder. Despite the heavy traffic the main roads had kept in a good condition, only the side banks, which are usually trim and neat, had been trampled into a bed of mud.

As the general headquarters were approached at Fere en Tardenois conditions changed. Third and fourth class roads had to be used. As heavy rain had fallen, these roads had suffered severely. In most cases there was nothing more than a central track with deep banks of mud on each side. The conditions reminded me particularly of those in the Middle West states in America. When another car was met we each went as little into the mud as possible. When a convoy was overtaken the lorries had to be passed one by one, each passage being carried out at the risk of ditching the car.

### At British Headquarters

The full extent of the motor transport service in connection with the British army was realized in the village selected by Sir John French as his headquarters. About 2 miles before reaching this village hundreds of horse-drawn army transport wagons were passed in muddy fields. It was very rarely that I saw these vehicles in actual service other than bringing up provisions for themselves.

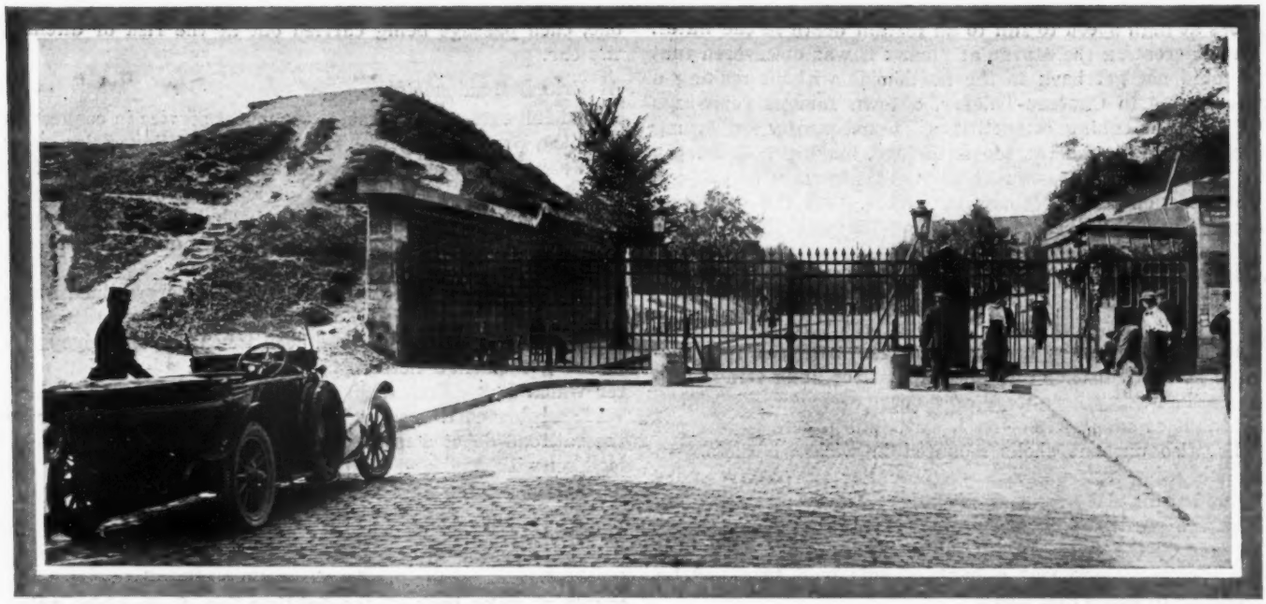
A mile outside of the town motor lorries were lined up in close formation for more than a mile. These were nearly all commercial vehicles which had been taken out of active service at a moment's notice and carried the advertising matter which forms such a distinctive note of this war. These vehicles formed a reserve called upon in rotation to go to the railroad depot a mile to the north of the town and there load up with food and ammunition to be taken direct to the firing line.

### Trucks in Firing Line

Originally the military plan was to make use of motor trucks for carrying supplies from the railhead to a point a couple of miles back of the fighting line, from which point the final distribution was made to the men by horse wagons. This plan has been altered, the motor trucks now going right up to the firing line and delivering direct to the men in the trenches. This system exposes the truck to fire and has caused a few of them to be lost, but the time gained is sufficient justification for its continuance.

During the 6 or 7 weeks the war has been in progress the British motor transport service has settled down to business in a remarkable manner and is now giving results which in the opinion of all officers are amazing. The army generally is showing itself highly efficient, but the motor transport service is certainly the best of its many branches. Since the outbreak of hostilities the weaklings and unsuitable types which were pressed into service too hurriedly have been abandoned and have been replaced by new trucks supplied by English factories. Judicious classification has also been indulged in, so that 5-mile-an-hour lorries are no longer made to keep pace with 12-mile-an-hour machines.

All that remained of the German motor truck convoy destroyed in the forest of Villers-Cotteret by the French after the fire



The gates of the City of Paris are now closed and no one is allowed to pass in or out of the walls without undergoing close scrutiny and having all papers, etc., carefully inspected

No work is being done away from made roads. The absence of cross-country work is made possible by reason of the network of roads in this part of Europe. One of the chief defects of several of the English makes of lorries is the lack of clearance. I noticed several cases of rear axles designed with a view to rapid inspection and quick dismounting, but without any thought that the vehicles might have to operate on mud roads. If the war continues throughout the winter, which is likely, many of these trucks will be incapable of operating on the third and fourth class roads.

Very useful, if not indispensable, accessories are differential locks and towing hooks, front and rear. Despite careful driving a truck would sometimes get off the road into the mud. As all journeys are made in convoys, it is always possible to get the vehicle out if hooks, a rope and differential lock can be used at once. Without these accessories serious stoppages are to be feared.

Generally cooling and lubricating systems are proving satisfactory. Up to the present all the motor trucks have used gasoline only. The British army has brought its entire supply from England, either in 2-gallon cans or in big kegs, and has never had to make use of such alternative fuels as benzol and alcohol.

### Army Headquarters Motorized

On the public square of the headquarters town there was an even greater scene of motor activity. Here were to be found 200 motor vehicles of every type. There were motorcycles, touring cars of all types, motor ambulances, trucks, omnibuses and a well-equipped motor workshop. A portion of a covered market at one end of the square formed a gasoline and oil depot. Close by was a van stocked with tires and accessories, while in the center of the square was the motor workshop. The equipment of this latter was simple but effective. The vehicle was an ordinary 4-ton chassis with a big platform body carrying a tarpaulin cover. Inside the body was a twin-cylinder Douglas motorbike motor generating current for electric lighting and for driving a lathe. Sixteen skilled mechanics were attached to this shop and at the time of my visit were working a day-and-night shift. A surprisingly extensive range of repair work was undertaken. While the equipment was sufficient to do almost any job, natural discretion was exercised; when the smash was of such a nature that it would unnecessarily tie up the resources of the shop the vehicle was abandoned rather than be repaired.

### 50 to 1 Officer Scheme

For every hour spent in the saddle, army officers in these days spend 50 hours in an automobile. Horses are maintained, but with the exception of cavalry officers it is a rare feature to see an officer on horseback. No particular type of touring car appears to be preferred, although English officers have a preference for a comfortable rather than a very fast car. The machine ought to be able to touch 45 miles an hour with ease and to keep up 40 miles an hour for long periods.

My own car is a Darracq of 16-horsepower rating, with no special features, but which does as good service as any other. The few special features for active service are absolute reliability, a very big range of action and adequate accommodation for tools and spares.

One of the British motor trucks at the front. Note that the advertising matter which it bore as a peaceful vehicle of commerce has not been removed. The British trucks are operated on gasoline brought from England with the troops

In most of the cars the gasoline tanks were too small, for in a war-devastated country it was often necessary to carry sufficient fuel for journeys of 400 to 500 miles.

An adequate oil supply was also necessary, and a car which could run very long distances without the bonnet being lifted for renewing the oil had an advantage over others.

### Tires Changed Under Fire

Spares which are unnecessary in civil life are indispensable for active service, but not many cars had the necessary space for carrying these. Detachable wheels are a valuable acquisition. On one occasion when drawn up for a tire change we were fired on by German stragglers hiding in the woods behind the Allies' lines. The change was made while shots were flying. Under such circumstances there was a wonderful amount of satisfaction in knowing that the change would occupy but a few seconds, for my car was fitted with detachable wire wheels.

An efficient system of lighting is indispensable. Electric-lighting appeared to give the best results, but this system requires so little attention that here is a tendency among drivers to give it none at all, with the result that it failed them when needed.

### Ambulances at Fire Line

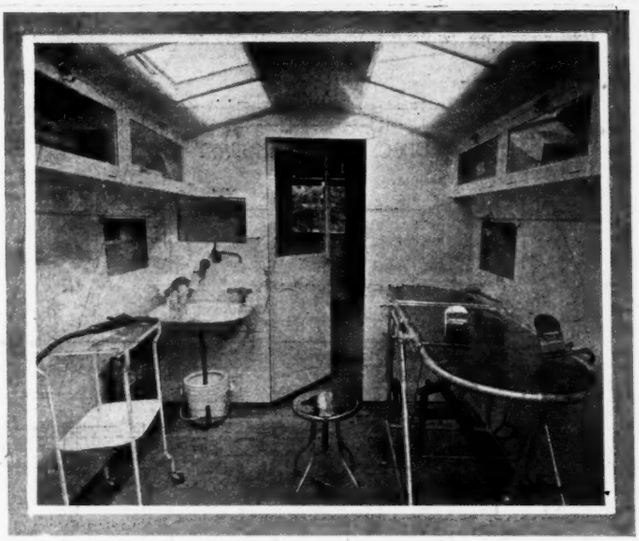
For ambulance work automobiles played just as important a role as in any other section of army activities. At this headquarters town there were a large number of 16-horsepower Wolseley fitted with light canvas bodies in which were four stretchers on rails. The stretchers were in two rows, with just sufficient room for the attendant to move between the two. These vehicles went close to the firing line, the wounded were picked off the ground by the stretcher men and the stretcher slipped into the van.

With its load of four wounded the ambulance returned to the headquarters town, which was never more than 10 miles behind the lines, and there discharged. In the town in which I am stationed the church was made use of as a hospital, the number of cases treated in this building being 2,000 on 2 successive days. After being given first attention in this temporary hospital, the officers and men were moved back to either permanent hospitals or nursing homes. A large amount of voluntary work was done in this connection.

While at the front I met R. N. Goode, of the Packard company, who was using a Packard car for carrying wounded officers from the front to the American hospital in Paris. The Paris branch of the Ford company gave important assistance in this work. Although these cars are small, they were fitted up according to a French system to carry six men in an inclined position. Light but strong hoops were fitted to the chassis, these hoops carried a waterproof cover, and the stretchers were attached in two rows of three to the hoops with a coil spring connection. Loading and unloading was not so rapid as with the British system, but there was the advantage of being able to carry two more men; further, the spring connections attenuated the road shocks.

### Night Trip to Front

After spending most of the day coming from Paris to the headquarters town and in making journeys in and around the headquarters, I was ordered to be in readiness for a night trip to the firing line. At this time the battle of the Aisne was at its height; the Germans had heavily shelled the English position for 2 days and 2 nights in an endeavor to break through before the French could carry out their flanking movement. Thus, as we set out the heavy guns were booming from the heights dominating the Aisne valley, and on the banks of the river Maxims were at work. After traveling some distance under headlights, the order was given to extinguish all lights and we slipped along quietly and cautiously, descended the hill leading into the valley, crossed the pontoon bridge and finally got into touch with the troops for which we were searching. All this northern bank of the river was held by the Allies, but the Germans above were strongly opposing their advance and kept up a heavy fire on them. It was only after considerable loss that the enemy was driven out of his position on the crest of the hills.



Interior of the operating room in one of the automobile ambulances used by the French army. Note the completeness of the equipment and the immaculate cleanliness throughout

When we returned to general headquarters it was 2 a. m. I was then allowed to go off duty. It was raining heavily, I had not been billeted, and the only place to sleep in was the rear of the car. A dozen other drivers were passing the night under similar conditions, our sleep being disturbed by the constant, steady rumble of motor trains taking ammunition to the front.

The following day was spent in carrying officers from point to point along the firing line. Passing down a straight stretch of road we were arrested by a group of peasants gesticulating wildly around a wrecked German motor van. As we pulled up they indicated that Germans were to be seen down a lane running through a wood on our left. The car was pulled up opposite the end of the lane, rapid orders were given for the motor to be kept running and the gear kept in engagement ready to slip away as quickly as possible, while rifles were got out. The men could be easily seen creeping along the hedge bottom, but as the officer was of the opinion that they were only stragglers, he fired a few shots and told me to move on. Their presence was reported to French scouts a mile down the road.

### No Rest for Drivers

Most officers allow their drivers little rest. The order was given one morning to return to Paris, a 4-hour journey at high speed. After visiting military offices the order was given at 1 o'clock in the afternoon to drive to the army base 150 miles to the southwest of Paris. There was no time for a meal, and in place of the usual—or unusual—lunch, I ate sandwiches while driving. The trip was made in 4 hours.

After the business had been transacted, dinner eaten and gasoline taken aboard, a night run was made back to Paris. Only military automobiles are allowed on the roads after nightfall, and even these are stopped at the entrance to all important towns. By the aid of the headlights it was possible to maintain almost as high an average during the night as in the day. On the whole run of 150 miles only one other car was seen on the road, and naturally there were no horse vehicles.

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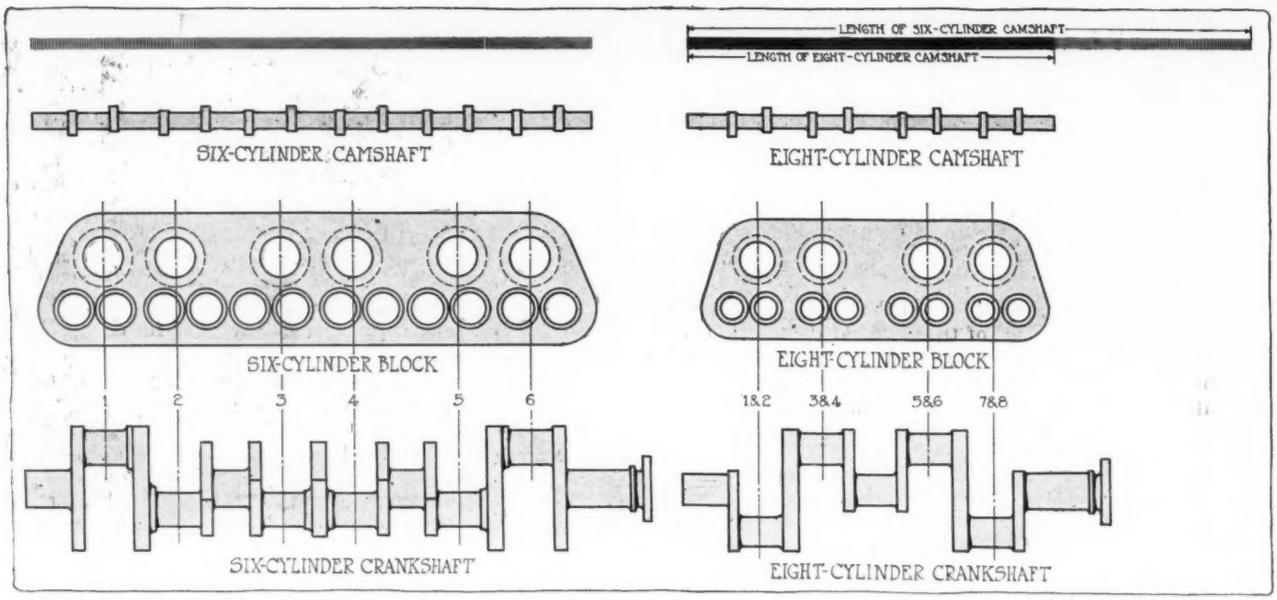



Comparative dimensions of six and eight-cylinder engines designed to develop the same horsepower at the same r.p.m.

# Eight-Cylinder Advantages

## A Comparison With Four and Six-Cylinder Designs

D. McCall White

*Late Chief Engineer Messrs. D. Napier & Son, Ltd., London, and formerly Works Manager of Messrs. Crossley Motors Ltd., Manchester, Eng., now associated with the Cadillac Motor Car Co., Detroit, Mich.*

EVER since the first use of the multi-cylinder, internal-combustion engines, engineers generally have been searching for an engine which would approach the action of a turbine as nearly as possible. As evidence of this tendency one need only look at the various applications for patents in different countries, many of which embrace points relating to internal-combustion turbines.

In short, the tendency of later years has been to obtain an engine having high flexibility, freedom from vibration, combined with general sweetness and smoothness of action, with silence, and last but not least, continuous torque. These characteristics are all more or less combined in a practical manner in a carefully-designed eight-cylinder engine.

### Engineering All Compromise

As every engineer knows and recognizes, all engineering designs are a matter of compromise and therefore, the careful and intelligent engineer selects and takes a line on all those prints which he hopes to obtain, not sacrificing any one point in its entirety, but molding the whole design into as successful a compromise as he is able to place before the public.

ONE CAN URGE, TECHNICALLY, MANY POINTS AGAINST EVERY TYPE OF ENGINE OR DESIGN WHICH WAS EVER PRODUCED, BUT THE ENGINEER WHO CAN DESIGN AN ARTICLE WHICH HAS THE TOTAL BEST COMBINATION OF GOOD THINGS, PRACTICALLY, HAS PRODUCED THE BEST ARTICLE FOR THE PUBLIC.

In the eight-cylinder proposition, therefore, which admittedly must be carefully designed and well manufactured, we have before us a prime mover which gives astonishing results in practically every direction one may look. The advantages are numerous and when one considers that we have practically continuous torque, owing to the fact that one cylinder fires every 90 degrees of the crank and that there are eight impulses extending over one cycle, each impulse lasting theoretically 75 per cent. of the stroke, one can easily appreciate what this means not only as regards smooth running of the motor, but as regards the wear and tear of the tires and parts of the chassis generally.

**For a given power the eight-cylinder is lighter than the six-cylinder.**

**The crankcase is decidedly lighter in the eight, being 25 per cent. shorter than in the six.**

**The crankshaft of the eight is practically the same length as that of the four-cylinder engine.**

**The eight-cylinder has torque 33 per cent. more uniform than that of the six.**

**The eight-cylinder V-engine is very adaptable for the grouping of all its accessories.**

**The camshaft in the eight-cylinder has eight cams as compared with twelve cams in the six-cylinder.**

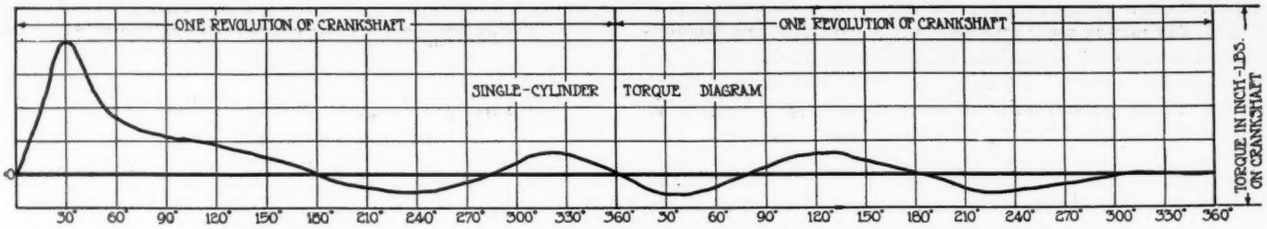
**The cylinder blocks in the eight-cylinder motor weigh 15 per cent. more than those in the six.**

**Connecting-rods in the eight-cylinder are more expensive than in the six.**

**The six-cylinder motor is more expensive than the eight because of its extreme length, and the fact that it must be rigid throughout to take care of this length.**

**Because of the cylinders being much smaller, a higher compression can be used in the eight-cylinder than in the six.**

**Mechanical efficiency of eight is high, as frictional losses are not great, as the quantity of rotating bearings are no greater than they would be in a four.**


ONE REVOLUTION OF CRANKSHAFT
ONE REVOLUTION OF CRANKSHAFT
SINGLE-CYLINDER TORQUE DIAGRAM
TORQUE IN INCH-LBS. ON CRANKSHAFT
30° 60° 90° 120° 150° 180° 210° 240° 270° 300° 330° 360° 30° 60° 90° 120° 150° 180° 210° 240° 270° 300° 330° 360°

Torque diagram of single-cylinder motor, showing the torque in inch-pounds on crankshaft

For a given power developed the engine is lighter than the six-cylinder by reason of the fact that the engine is no longer than a four-cylinder engine, the bore of the cylinders can be made smaller because there are more cylinders, thereby allowing the reciprocating parts such as pistons, connecting-rods and valve gear, to be made to the minimum as regards lightness.

The crankcase also is decidedly smaller and so far as length is concerned, is roughly 25 per cent. shorter than a six-cylinder engine crankcase, and is hardly, if any, longer than that of a four-cylinder engine.

Again the crankshaft is to all intents and purposes, practically the same length as that of a four-cylinder engine, which advantage is enormous not only from a weight point of view, but for reasons to be discussed later. We have also a very light flywheel on the eight-cylinder engine as compared with engines having fewer number of cylinders.

It is generally accepted that whilst there are several more values, the fact that they are smaller enables them to be well silenced and the continuous rhythm of the motor and the action of the tappets on the cams makes the turning moment practically continuous on the camshaft. In fact, this point has been generally recognized in Europe by engineers who have endeavored to steady up the uneven turning moment on the camshaft on engines by placing dummy loaded tappets at various angles on the camshaft.

Others again have a form of brake upon the camshaft to minimize this defect.

Again, the eight-cylinder engine has a crankshaft very little longer than the ordinary four-cylinder engine as previously mentioned, which in itself is a point on which great stress can be placed as one of the most serious defects which can be laid to engines which have long crankshafts is the disturbance which occurs at certain periods of engine speed. This can be overcome in a measure, by fitting a crankshaft of enormous dimensions which interferes with the mechanical efficiency of the engine as a prime mover and accounts, in common, with other points, for the difficulty many engineers have in obtaining equal power, cylinder for cylinder, from the six-cylinder engine against the four. Naturally, of course, this does not always apply, but certainly has a whole lot to do with this seeming inefficiency, when the six-cylinder is exceptionally smooth in action as regards periodic tremor. Many designers fit a damper on the front end of the six-cylinder crankshaft thus tending to absorb the periodicity. The crankshaft is undoubtedly simpler in construction and certainly is a cheaper manufacturing proposition than that of the six-cylinder engine and need only be supported upon main bearings similar to that generally employed on a good four-cylinder engine.

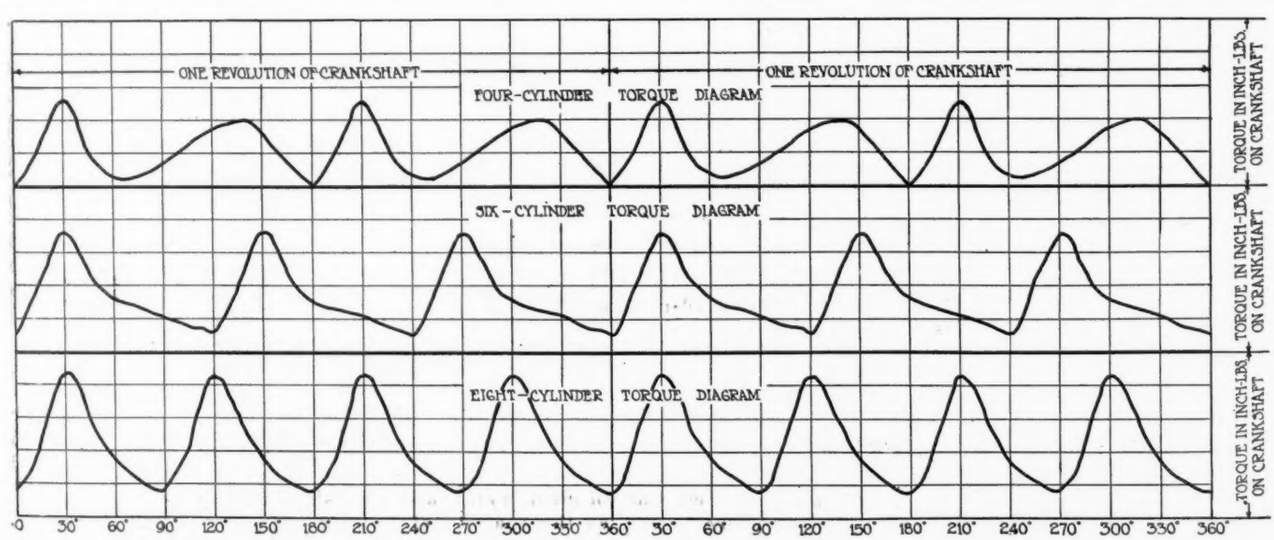
### Torque 33 Per Cent. More Uniform

We have also the question of the camshaft, which should be in every engine as rigid and as free from torsional disturbance as possible. In order to demonstrate this point a comparison is made in the accompanying figure of a six and eight-cylinder camshaft, suitable for developing the same horsepower at the same speed.

Owing to the practically continuous torque of the eight-cylinder engine, the variation of the turning moment is very small, the torque being about 33 per cent. more uniform than that of the six-cylinder engine and for this reason the designer can dispense with a considerable amount of weight in the flywheel rim, as previously mentioned, which every engine must have to steady up the torque variation, storing the maximum load and giving it forth again when the load given forth becomes low, thus allowing as little speed fluctuation as possible, so that, therefore, the less the torque variation and the more frequent the impulses, the less kinetic energy required to be stored up by the flywheel.

The carburetion, which is one of the most serious and vital points in multi-cylinder engines, generally becomes a proposition as simple as the carburetion in a four-cylinder engine.

The eight, designed for high efficiency, with its magnificent


ONE REVOLUTION OF CRANKSHAFT
ONE REVOLUTION OF CRANKSHAFT
FOUR-CYLINDER TORQUE DIAGRAM
SIX-CYLINDER TORQUE DIAGRAM
EIGHT-CYLINDER TORQUE DIAGRAM
TORQUE IN INCH-LBS. ON CRANKSHAFT
0 30° 60° 90° 120° 150° 180° 210° 240° 270° 300° 330° 360° 30° 60° 90° 120° 150° 180° 210° 240° 270° 300° 330° 360°

Comparative torque diagrams of four, six and eight-cylinder motors, showing increase in uniformity with added cylinders

torque at low speeds, makes the necessity of changing gear practically non-existent and where one considers that flexibility and a range of speeds can be obtained from 75 revolutions per minute to from 2,800 to 3,000 revolutions per minute or more, it can be appreciated what delights are before the prospective driver when such variation can be obtained with perfect smoothness all along the scale. So smooth indeed can these engines be made, that, when the air is stationary, a pencil can be placed on end on the mudguard and the engine raced up to a high number of revolutions without any movement whatever on the part of the pencil.

The cooling also is all that could be desired as the water naturally rises to the highest and hottest parts of the cylinders, viz: the water jacket around the valves.

The engine being short, the bonnet naturally becomes so, with the result that space which would otherwise be used for an engine having cylinders all in a line, can be used for body space.

In such countries as the United States, wherever torque at low speeds is much to be desired, owing to road conditions, such an engine pulls smoothly and evenly and with great power in heavy and on direct gear and can climb and accelerate from very low speeds indeed on heavy hills.

### V Design Very Adaptable

The disposition of an eight-cylinder engine when designed on the V principle leads itself nicely to the placing of the various units so necessary to the present day automobile, such as starting or lighting outfits, as well as tire pump, etc.

To illustrate comparisons clearly, the accompanying illustrations show parts of two engines, a six and an eight-cylinder, designed to develop the same horsepower at the same revolutions per minute. It will be observed that the six-cylinder engine gains as far as cylinder weight is concerned, but on the other hand, the gain is lost when one considers the weight and cost of the six-cylinder crankshaft and crankcase against the eight-cylinder crankshaft and crankcase. The same naturally applies to the camshaft.

It would be easy to go into the details and carefully analyze each point for and against these two known types of multi-cylinder engines, chief amongst these being the easy manufacturing possibilities of the eight-cylinder camshaft which has eight cams and fewer supporting bearings against the twelve cams on the six-cylinder; four throws on the crankshaft instead of six, all of which former are on one plane, while those of the latter are at 120 degrees to one another, requiring at least one more main bearing journal to support the shaft.

Regarding the matter of the cylinders, although there are two blocks the combined weight of which is greater than that of the six-cylinder by about 15 per cent., they certainly counterbalance their combined increased weight by the ease with which they can be handled in the factory.

The eight connecting-rods are more expensive than the six-cylinder owing to the fact that two more rods are used although this fact is, to some extent, balanced by there being two less crankpin end bearings.

The six-cylinder crankcase is an enormously expensive part against that of the eight-cylinder, chiefly, owing to its extreme length and the fact that it must be made so rigid to take care of this length as well as the added main bearings and camshaft bearings.

### Higher Compression in Eight

Regarding the question of comparative economy, the writer is of opinion, not only theoretically, but from practical observation, that the eight-cylinder is just as economical as a four-cylinder of equal power, chiefly due to the fact that the cylinders being much smaller much higher compression can be used without distress and also to the splendid distribution of the gases.

In addition to this point it is much easier to keep the eight-cylinder engine running along without the throttle being very far open owing to its better torque, thus adding to its economy.

WITH REFERENCE TO MECHANICAL EFFICIENCY, THE V-TYPE EIGHT SHOWS UP VERY WELL INDEED AS THE FRICTIONAL LOSSES ARE NOT GREAT OWING TO THE QUANTITY OF ROTATING BEARINGS BEING NO GREATER THAN THERE WOULD BE ON A GOOD FOUR-CYLINDER ENGINE.

One large company in France has already adopted the V-type of eight-cylinder engine as standard and while they may be the first people to produce in large quantities, they are not, so far as the writer is aware, the first people to produce this type of engine.

We have the famous French eight-cylinder, V-type racing Darracq engine which put up some splendid speed tests several years ago on the Florida beach, as well as the Rolls-Royce Co., Derby, England, which produced and manufactured an eight-cylinder V-engined automobile known as the Legalimit car.

As far back as the year 1907-1908, the Daimler Motor Co, (1904) Ltd., Coventry, England, with which the writer was at that time associated, produced eight-cylinder V-type engines, the bore being 154 millimeters and the stroke 150 millimeters.

There has also been the well known eight-cylinder aviation motor known as the Antoinette as well as one or two others.

### Torque Diagrams for Comparison

In the matter of torque between various engines some graphic diagrams are shown and afford an interesting comparison between single-cylinder, four-cylinder, six-cylinder and eight-cylinder engines of the same size cylinders.

The horizontal line has been divided into degrees of crank movement—each 360 degree representing one revolution, whilst, naturally, 180 degrees represents one stroke, the total length of the diagram being one complete cycle or two complete revolutions.

The vertical lines represent the torque in inch-pounds on the crankshaft.

For a single-cylinder engine, all the forces tending to twist the shaft in the positive direction are about the zero line, and all those which are negative are below the line.

It is therefore, not difficult to understand how these diagrams have been laid out, for the torque of engines, having various numbers of cylinders, is simply the torque of a single-cylinder superimposed at the correct intervals on the same crankshaft. One of the most interesting points to be noted is the positive increase of torque which occurs in a four-cylinder engine during the second third of each stroke.

Naturally, after an explosion, the torque falls off rapidly, and owing to the effect of the other pistons, it becomes very low after the crank has passed 65 degrees of a revolution. Suddenly, however, around this point the torque is increased again and actually attains a large proportion of its maximum value.

This is not due to another explosion, however, but to the curious effect of the other pistons. Thus, instead of the torque being further reduced throughout the exhaust stroke, it actually changes direction merely because of the momentum of the piston.

The same applies to the suction-stroke and compression-stroke which latter hardly shows negative torque at all.

It is these particular points which explain to a great extent the splendid results obtained from the four-cylinder engine. The six-cylinder engine undoubtedly has many points to recommend it, chief amongst which is the more or less smooth torque in comparison with engines with fewer cylinders, and has also many points in common with the eight-cylinder engine.

# Counterbalancing the Crankshaft

## Engineers Add Weights to Neutralize Pressure on Bearings Caused by Centrifugal Force of Masses That Are in Rotary Balance but Not in Centrifugal Balance —Mathematics Needed in Determining Size of Counterweights

By L. J. Petre
*Consulting Engineer*

THE idea of counterbalancing a crankshaft is usually associated with single-cylinder engines wherein the aim is elimination, or partial elimination, of vibration. IN THE DEVELOPMENT OF THE HIGH-SPEED AUTOMOBILE ENGINE, IT HAS BEEN FOUND ADVANTAGEOUS TO COUNTERBALANCE THE CRANKSHAFT FOR THE PURPOSE OF RELIEVING THE BEARINGS OF EXCESSIVE PRESSURE DUE TO CENTRIFUGAL FORCE.

### Center Bearing Suffers

The pressure on the center bearing of a three-bearing, four-throw crank may in some cases be sufficient to break down the lubricant before excessively high speed is reached. The fact that the center bearing in engines of this type do not wear as well as the end bearings has been observed by repair men.

That this difference may be largely due to the centrifugal force caused by the rapid revolution of the two intermediate crankpins together with their connecting rod big ends, would hardly be suspected. In fact, if asked, off-hand, whether there be any pressure on the main bearings of a crank of this type due to centrifugal force, the average engineer would probably answer that, inasmuch as the shaft is symmetrical and may be shown to be in running balance by means of a running balance machine, there can be no pressure of this nature. HOWEVER, WHEN THE ACTUAL PRESSURE ON EACH BEARING, DUE TO THIS CAUSE, HAS BEEN ONCE DETERMINED FOR SPEEDS BETWEEN 2,000 R.P.M. AND 3,000 R.P.M. THE SUSPICION IS READILY JUSTIFIED.

### Determining Centrifugal Pressure

The process of determining this pressure consists of ascertaining:

First: Either by weighing or by calculation, the weights of each of the unbalanced* masses.

The big ends of the connecting-rods, the crankpins and usually some adjacent portions of the crankcheeks, Fig. 1 at W, X, Y and Z, are examples of unbalanced masses since they are balanced by similar parts located in other planes of revolution.

Second: The location of the center of gravity of each of these unbalanced masses.

### Getting the Center of Gravity

To find the center of gravity of a flat piece of this kind, suspend it from one corner by means of a string, Fig. 2; drop a plumb line through or close to the point of support and draw across the face of the piece a line showing the position of the plumb line. Now suspend it from another corner, drop the plumb line through the point of support and the intersection of the two lines will show the location of the center of gravity.

Third: The centrifugal force due to each of these masses.

Fourth: Distribtion of these forces to each bearing.

### The Necessary Calculations

The calculations necessary for determining these are as follows: Suppose that we find the weight of the big end of the connecting-rod, Fig. 4, is 3.75 pounds, and for simplicity we assume (as in this case is practically correct) that the center of gravity coincides with the center of gravity of the crankpin (see Fig. 4), that the weights of crankpin and weight W, Fig. 1, are 3.5 pounds and 3.75 pounds, also that the locations of their centers of gravity are as shown

*An *unbalanced mass* here means any weight or portion of the crank whose counterpart or counterweight does not revolve in the same plane.

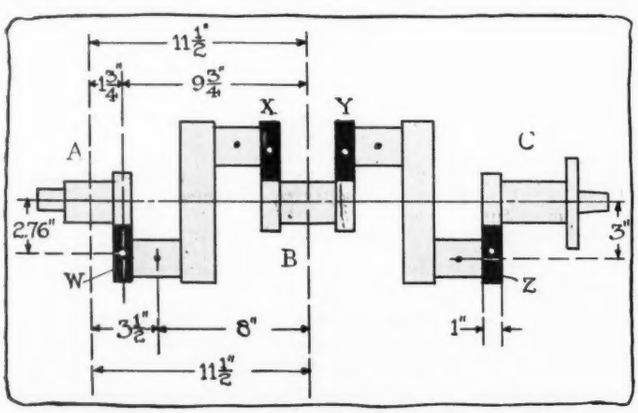



Fig. 1—Big ends of the connecting-rods, the crankpins and usually some adjacent portions of the crankcheeks at W, X, Y and Z, are examples of unbalanced masses since they are balanced by similar parts located in other planes of revolution. For instance, X and Y balance W and Z

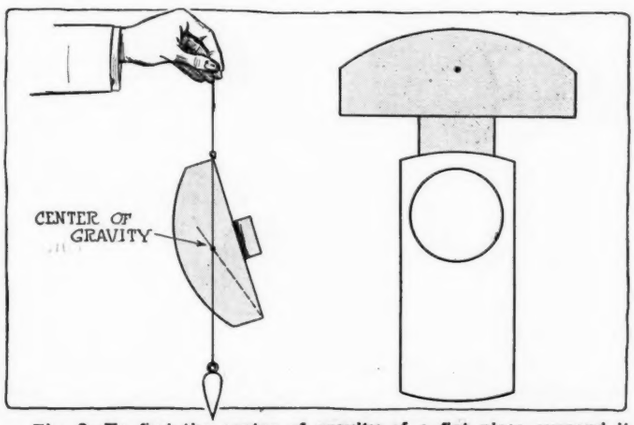



Fig. 2—To find the center of gravity of a flat piece suspend it from one corner by a string, drop a plumb line through point of support and draw a line showing the position of the plumb line. Suspend it from another corner and repeat, the intersection indicates center of gravity

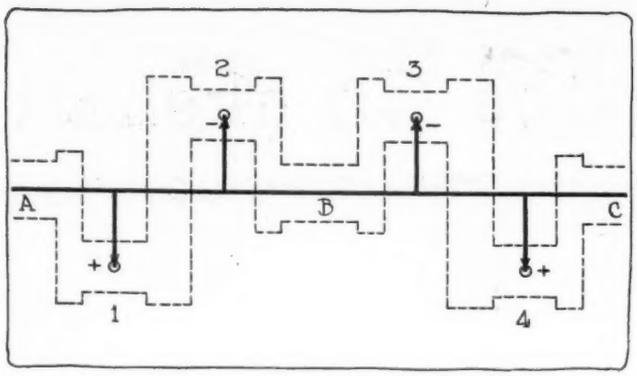



Fig. 3—Diagram showing the points of application of the forces on the crankpins as projected in the horizontal plane

by dimensions, Fig. 1, and that we assume a speed of 2,400 revolutions per minute.

The centrifugal force, F, equals:

$$F = 1.2276\ WRN^2.$$

Where F = centrifugal pull in pounds.
W = weight in pounds.
R = radius in feet.
N = revolution per second.

For big end of rod

$$F = 1.2276 \times 3.75 \times .25 \times 1,600 = 1,841 \text{ pounds.}$$

For crankpin

$$F = 1.2276 \times 3.5 \times .25 \times 1,600 = 1,718 \text{ pounds.}$$

For W

$$F = 1.2276 \times 3.75 \times .23 \times 1,600 = 1,694 \text{ pounds.}$$

Since the center of gravity of the rod big end and that of the crankpin coincide we have a total force of 1,841 + 1,718 = 3,559 pounds acting in a plane 1 1-4 + 1 + 1 1-4 = 3 1-2 inches from the middle of bearing (*a*) and 8 inches from bearing (*b*).

Similarly we have a force of 3,559 pounds acting in a plane 3 1-2 inches from bearing (*b*) and 8 inches from bearing (*a*), but the force due to crankpin No. 1 is in one direction which we shall call positive (+), while the force due to crankpin No. 2 is in the opposite direction which we shall call negative (—). The directions and relative locations of these forces are illustrated diagrammatically in Fig. 3.

The total resultant forces acting upon each of the three bearings due to each of the four crankpins and rod big ends is as follows:

$$\text{On A due to} \begin{pmatrix} \text{No. 1} = +3,559 \times \frac{8}{11\frac{1}{2}} \\ \text{No. 2} = -3,559 \times \frac{3\frac{1}{2}}{11\frac{1}{2}} \end{pmatrix}$$

$$= +3,559 \times \frac{4\frac{1}{2}}{11\frac{1}{2}} = +1,392 \text{ lbs.}$$

$$\text{On B due to} \begin{bmatrix} \text{No. 4} = +3,559 \times \frac{3\frac{1}{2}}{11\frac{1}{2}} \\ \text{No. 2} = -3,559 \times \frac{8}{11\frac{1}{2}} \\ \text{No. 3} = -3,559 \times \frac{8}{11\frac{1}{2}} \\ \text{No. 4} = -3,559 \times \frac{3\frac{1}{2}}{11\frac{1}{2}} \end{bmatrix}$$

$$= -3,559 \times \frac{9}{11\frac{1}{2}} = -2,784 \text{ lbs.}$$

$$\text{On C due to} \begin{pmatrix} \text{No. 3} = -3,559 \times \frac{3\frac{1}{2}}{11\frac{1}{2}} \\ \text{No. 4} = +3,559 \times \frac{8}{11\frac{1}{2}} \end{pmatrix}$$

$$= +3,559 \times \frac{4\frac{1}{2}}{11\frac{1}{2}} = +1,392 \text{ lbs.}$$

In the same manner the weights W, X, Y and Z distribute their pressure as follows:

$$\text{On A due to} \begin{pmatrix} \text{W} = +1,694 \times \frac{9\frac{3}{4}}{11\frac{1}{2}} \\ \text{X} = -1,694 \times \frac{1\frac{3}{4}}{11\frac{1}{2}} \end{pmatrix}$$

$$= +1,694 \times \frac{8}{11\frac{1}{2}} = +1,178 \text{ lbs.}$$

$$\text{On B due to} \begin{bmatrix} \text{W} = +1,694 \times \frac{1\frac{3}{4}}{11\frac{1}{2}} \\ \text{X} = -1,694 \times \frac{9\frac{3}{4}}{11\frac{1}{2}} \\ \text{Y} = -1,694 \times \frac{9\frac{3}{4}}{11\frac{1}{2}} \\ \text{Z} = +1,694 \times \frac{1\frac{3}{4}}{11\frac{1}{2}} \end{bmatrix}$$

$$= -1,694 \times \frac{16}{11\frac{1}{2}} = -2,356 \text{ lbs.}$$

$$\text{On C due to} \begin{pmatrix} \text{Y} = -1,694 \times \frac{1\frac{3}{4}}{11\frac{1}{2}} \\ \text{Z} = +1,694 \times \frac{9\frac{3}{4}}{11\frac{1}{2}} \end{pmatrix}$$

$$= +1,694 \times \frac{8}{11\frac{1}{2}} = +1,178 \text{ lbs.}$$

The total pressure on the center bearing due to centrifugal force = — 2,784 — 2,356 = — 5,140 pounds.

On end bearings = + 1.394 + 1.178 = + 2,570 pounds.

On connecting-rod bearings = 1,841 pounds.

The pressure on the main bearings may be eliminated by the use of counterweights located opposite the crank cheeks W, X, Y and Z.

The pressure on the connecting-rod bearing may be only slightly reduced since it is controlled by the weight of the big end of the rod, the strength of which must not be sacrificed.

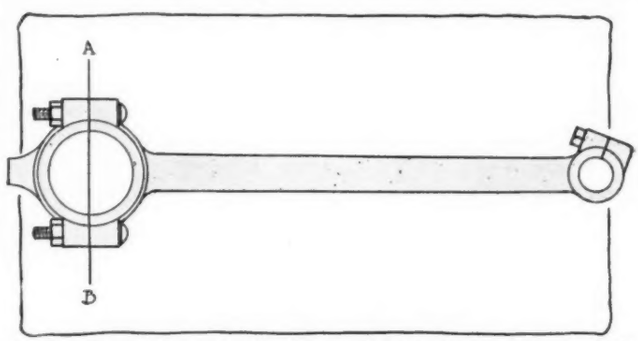



Fig. 4—Connecting-rod, showing horizontal plane A B in which forces are applied to crankpins

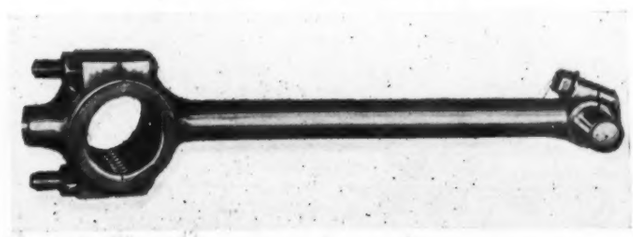


Fig. 5—Tubular form of connecting-rod, showing extension at lower end for balancing

However, at the time of the explosion the pressure on the rod bearing is reversed, thus permitting a renewal of the oil film.

THE SHAPE AND SIZE OF COUNTERWEIGHTS REQUIRED TO ELMINATE PRESSURE ON MAIN BEARINGS IS DETERMINED PARTLY BY THE CLEARANCE SPACE ALLOWED IN THE CRANKCASE.

THE CLOSER (LONGITUDINALLY) THE COUNTERWEIGHT IS TO THE BEARING TO BE PROTECTED AND THE GREATER THE RADIAL DISTANCE FROM ITS CENTER OF GRAVITY TO THE AXIS OF THE SHAFT THE LESS WILL BE THE WEIGHT REQUIRED.

As a rule, it will be found necessary to make the counterweight nearly as large as the space will permit. Fig. 4 shows in section a convenient form of counterweight, the weight of which may be regulated by the thickness. The center of gravity may be found mathematically or experimentally as may also the weight. Suppose it is found possible to locate the center of gravity of the counterweight 3 1-2 inches from the axis of the crank and that the maximum weight possible is 7 pounds and thickness = 1 inch.

$$F = 1.2276 \times 7 \times \frac{3.5}{12} \times 1{,}600 = 4{,}010 \text{ lbs.}$$

The pressure on bearing ($a$) will be:

due to counterweight $1 = -4{,}010 \times \frac{9\frac{3}{4}}{11\frac{1}{2}}$

Fig. 6—Counterbalanced crankshaft which is designed to eliminate whipping at peripheral speeds

due to counterweight $2 = +4{,}010 \times \frac{1\frac{3}{4}}{11\frac{1}{2}}$

$$= -4{,}010 \times \frac{8}{11\frac{1}{2}} = -2{,}789 \text{ lbs.}$$

This being slightly more than necessary, the thickness may be reduced from 1 inch to:

$$2{,}570 \div 2{,}789 = .921 \text{ or practically } \frac{59}{64} \text{ inch.}$$

—L. J. PETRE, 13,242 Forest Hill road, Cleveland, O.

# With a Car at the Front in France

(*Continued from page* 659)

As we approached Paris the control became particularly severe. Down the road the glitter of a bayonet would be seen and the word "Halte" would ring out. It was necessary to pull up sharply, for the sentinels in this part of France are territorials whose guns go off easily. Climbing a winding hill at a rapid clip, I had just made an unsuccessful attempt to avoid running down a cat when I became conscious of a figure dancing a jig in the center of the road ahead of me and pointing a bayonet at the car. It was an inexperienced territorial looking for the most vulnerable part of a car to attack with a bayonet. I relieved him from his embarrassment by pulling up a couple of inches from the end of his steel. Very cautiously he came round to the side of the car and demanded our papers, which were presented and examined in silence.

### Barricades on Roads

On the outskirts of Versailles barricades had been put across the road. They consisted of two walls, each one-half the width of the road, placed on opposite halves and about 10 yards apart. It is possible to zigzag through them, but utterly impossible to go by at speed. As no lights are employed, it is necessary to keep a sharp lookout to avoid running into the barricades.

Two days before a group of German spies dressed as English officers had attempted to get into Paris with an automobile at night. They had actually got inside Versailles before their daring attempt was discovered. In consequence of this we were submitted to a searching examination at each post. To add to the difficulties it was discovered that we had been given the wrong password for that night. We were held up at the point of the bayonet while the guard was turned out and officers were brought. Fortunately among the officers there was a personal friend, who understood the mistake, and gave us the correct password, with which we could enter deserted Paris at 2 a. m.

At 8 a. m. that morning a start had to be made for the firing line. The trip was made through the forest of Villers-Cotteret, where a day before the French had destroyed a German motor train of sixteen vehicles. The train was entirely loaded with gasoline and was surprised by a body of French dragoons reconnoitering in the forest. By a well-directed shot the driver of the first truck was brought down. Deprived of its guiding hand, the vehicle zigzagged wildly about the road, causing the followers to collide with it. In the confusion of the attack fire broke out and in a few seconds those sixteen trucks were a mass of twisted iron.

### Germans Wreck Cars

Automobile captures are rather rare. Whenever the Germans are hard pressed and have to leave their vehicles they generally find time to wreck them. The method usually adopted is to take off the radiator and throw it in the river if there is one near, or carry it away. The Allies are almost equally careful not to allow their cars to fall into the hands of the enemy; the result is that the country-side is strewn with wrecked cars. When this war is over the work of replacement will be enormous. Such a killing pace has to be maintained and the time allowed for adjustments is so short that even the best of cars must have a shortened life.

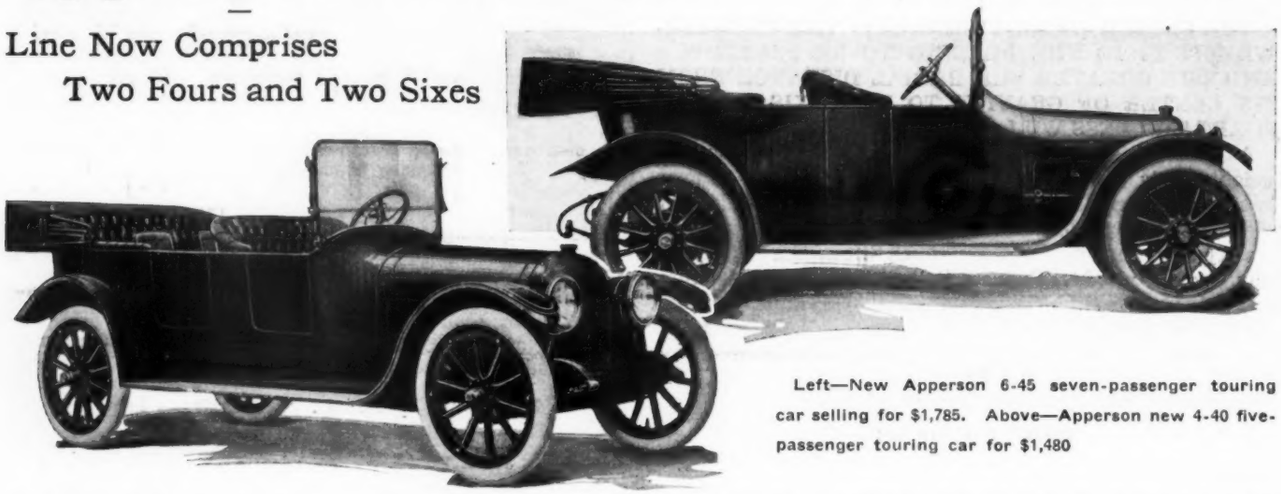
From what I have been able to observe, the Germans are making a greater use of motor guns than are the Allied forces. When the war broke out the English and French had very few armored cars. The Germans, on the other hand, had large numbers in readiness and certainly have used them with effect. With guns mounted on automobiles the Germans are able to keep up a steady fire until the enemy is almost on them and then get away in safety with the guns.

In a certain measure this inferiority of the Allies in the matter of automobile guns has been removed since the war broke out. The French army has obtained from the De Dion Bouton and Schneider factories a special chassis capable of carrying really heavy guns and with such provision that the guns can be fired from the chassis. When the gun goes into action the chassis is stiffened by a series of struts.

Coming through a certain town at midnight I was able to appreciate the important role played by automobiles in moving troops rapidly from place to place. In the wide avenues and public square of this town fully 1,000 touring cars and about 200 motor buses and observation cars were drawn up in orderly lines ready to move a mass of infantry. There was provision for moving 8,000 men at 25 miles an hour.

# Apperson Adds New Four and Six

## Line Now Comprises Two Fours and Two Sixes



Left—New Apperson 6-45 seven-passenger touring car selling for $1,785. Above—Apperson new 4-40 five-passenger touring car for $1,480

TWO entirely new cars, one a four and the other a six, have been added to the Apperson line for the 1915 season. This brings the number of models marketed by this concern, which is now in its twenty-third year, to four—two fours and two sixes.

The two new cars are similar in design, although the dimensions of the motors and the wheelbases are different. The new four, which is known as model 4-40, is built on a 116-inch wheelbase and has a 4 by 5-inch power plant with L-head block cylinders. The new six is known as model 6-45 and has a 3.5 by 5.125 motor, and also has the cylinders of L-shape in a single casting.

Both these cars incorporate many features of design which have hitherto been unknown to Apperson practice. In the motor castings the core work has been so arranged that the air before reaching the carbureter is drawn through a passage cast in the exhaust manifold, and passes along the heated metal. In the six this heated air scheme has been carried out even more thoroughly than in the four, as in this motor there is no exterior air pipe to the carbureter. In the four the air enters the passage in the exhaust manifold casting and is led through to the other side of the motor, and then by means of a flexible tube, to the carbureter.

Another unique feature that will be seen in the new Apperson is the method of carrying the spark and throttle linkage. As the carbureter is on one side of the engine and the magneto on the other, it is necessary to carry a transverse control rod. This has been neatly taken care of by a tube which passes straight through the motor casting acting as a bearing for this transverse shaft.

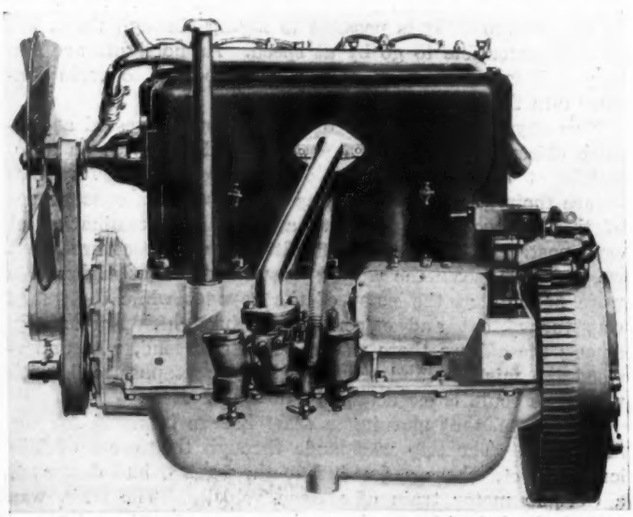
### Narrower Turning Radius

While the suspension of the motor is the same as that of previous Appersons in that it is carried rigidly at four points, an alteration has been effected in the narrowing of the main frame, which not only provides a strong motor support with all the advantages of a sub-frame, but also permits of a narrower turning radius in steering the car.

Force-feed lubrication to the main and crank bearings is continued in both the new four and six, but it has been improved in that independent force feed leads are also carried to the bearings of the camshaft.

The water-cooling system on these new Appersons is different from that employed on any other American car. The water is pump-circulated by centrifugal impeller mounted in in a casing forward of the timing gears. It is carried to the top of the water-jacketing instead of to the bottom as is the general practice. The casting which acts as the water outlet on the top of the cylinders is a double one, serving also the purpose of a water feeder. Baffle plates and partitions are so arranged in the cylinder casting that the water passes down on one side of the cylinder, and up on the other, forming a complete circulation. The baffling arrangement in the four differs from that used in the six. In the former the water enters the jacketing space on the left side, and flows downward to the bottom of the jacket and then up on the right side back to the radiator. On the six, the water is led along a space at the tops of the cylinders until it reaches the rear end of the motor, and then passing a horizontal partition, it flows back to the forward end, and then out to the radiator.

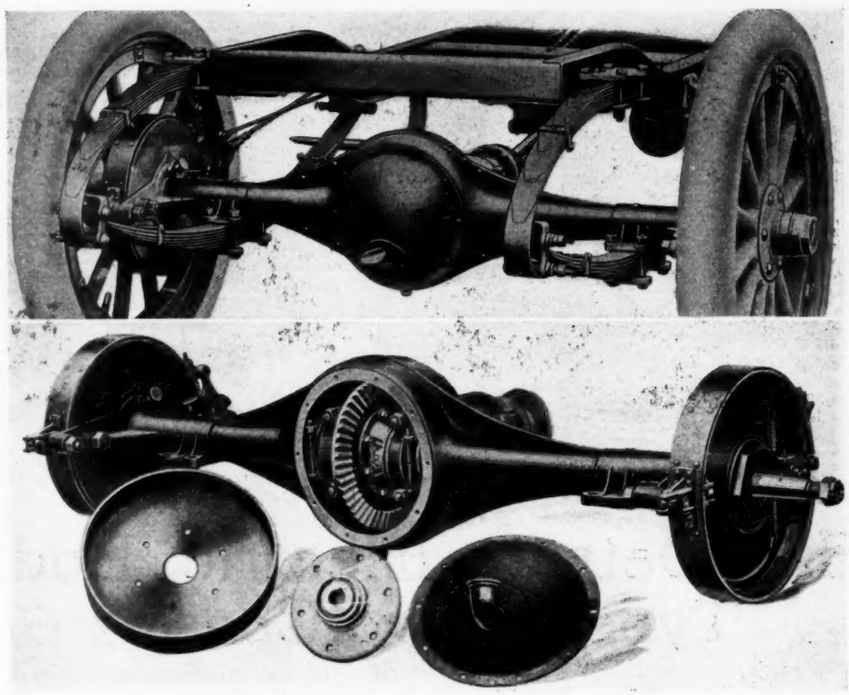
Some slight detail changes in the actual construction of the chassis will also be noticed. These are all in the line of lightening and simplifying the car without in any way detracting from its structural strength. The transverse shaft which carries the brake and clutch covers is an example of this. This shaft formerly extended all the way across the frame construction. It is now only one-half its former length, and is supported from the transverse angle bar that



Left side of four-cylinder motor used in Apperson 4-40, showing mounting of Rayfield carbureter and Bijur cranking motor

acts as the support for the forward end of the gearbox.

Another factor in the production of the very simple chassis is in the mounting and arrangement of the brake and clutch control members. Practically all of these are assembled directly in the gearbox cover plate. In fact, when the latter is removed, it carries with it the gearshifter lever, emergency brake lever, their bearings and supports and the shifter forks. There is now a flexible coupling between the clutch and gearbox which takes care of any misalignment between these two units. The fulcrum of the emergency brake lever is on a direct level with the floorboards. By this arrangement it is not necessary to cut any slot in the floorboards for the passage of the lever, but merely to have a large enough opening for the insertion of the pivot point.



Upper—Rear construction of new Apperson cars showing small differential housing and underslung rear spring. Lower—Rear axle partially disassembled, showing brake construction

### Drive Taken Through Springs

The rear support of the gearbox is the same as in the past and the drive members from that point back are much the same. Double universal joints, floating axle, and double brakes, one metal-to-metal, and the other fabric, still remain features of Apperson practice. A feature that is an innovation on the new cars is that the drive is taken through the springs. The spring hangers are new, being in the case of the rear support integral with the frame gusset plates, and of strong ribbed section. The front brackets for the rear springs are also new, being of cast steel, and having a double T-section.

This season the Bijur lighting and starting system will be standard equipment. This is a 6-volt double-wire outfit capable, according to the Apperson engineers, of spinning the new four, under ordinary conditions, at a speed of from 90 to 150 revolutions per minute.

The bodies supplied with the new cars have been brought up to date in every particular. On both the 4-40 and 6-45, only the five-passenger touring style is at present supplied. These are painted a special grade of dark blue which the Apperson company has named Elgar blue. They are of modified streamline design with a rounded radiator, having a shield-like dome top, which moulds into the contour of the bonnet. All the control members and the instruments are mounted on a cowl board, which is slightly in-set so as not to interfere with the knee room of the driver. The price of the four with this body, including electric lighting, starting and full equipment, is $1,485, that of the six $1,785.

### Power Plants of Similar Design

The power plants on these two new cars are similar in design, although the dimensions are different and there are many other differences in the actual construction. For instance, the piston rings on the four-cylinder model are three in number for each piston, while on the six there are but two. Both pistons, however, are fitted with oil rings. The length of the piston on the four-cylinder is 5.25 inches, while on the six it is 5 inches. The dimensions of the bearings of the crankshafts are also different. On the four-cylinder model, there are three main bearings, the crankshaft is 1.875 inches in diameter for all three bearings, and the lengths of these bearings are respectively 2.5, 3 1-16 and 4 inches for the center, front and rear. On the six, the crankshaft is 2 inches in diameter and is supported on four bearings, the lengths of these being respectively 2 13-16, 2, 2 and 3.25 inches for the front, two centers and rear. Connecting-rod bearings on the six are 2 inches in diameter and 2 inches in length.

The valve action on both models is inclosed by cover plates and is on the right side. The Rayfield carbureter is on the left, and the air intake is led from the opposite side of the motor as previously described. Carbureters are of different sizes, that on the four being a 1 inch, and on the six a 1.25 inch.

An Eisemann magneto forms the sole source of ignition current on both the four and six.

No change has been made in the contracting band clutch which has formed a part of Apperson construction for several years. The component parts of this clutch comprise principally a band and flanged drum. The band is contracted upon the surface of the drum by linkage somewhat similar to that used in operating a contracting brake. Directly behind the drum there is the flexible coupling and then the three-speed gearset which also has been unaltered for this season.

### Small Differential Housing

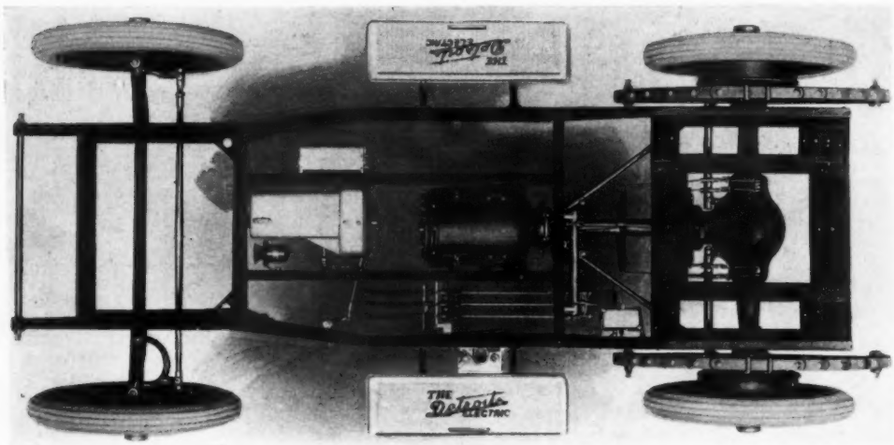
There are two universal joints in the drive and the torque is taken through the rear spring which is underslung on the two new models. The construction of the rear axle is worthy of attention in that the differential and drive pinion have been kept in an exceedingly small housing 6-16-inch thick.

The bearing equipment on both new cars is similar. Timken rollers are used for the pinion shaft and outer end of the axle, while Hyatt's are used for the differential in connection with a ball thrust.

Pressed steel has been used to advantage in many of the small fittings about the car, for instance, in the step hangers, rear tire carriers, and so forth, besides the axle housing and drums. Sheet metal stampings are used to support the muffler instead of the malleable brackets employed in former models. Wood wheels are used as standard on both the new cars, the tire sizes on each being 34 by 4 inches.

Left drive and center control is used on all Apperson cars.

(*Continued on page* 679)



Plan view of chassis used in new Detroit electric. Note controller in housing ahead of motor

# Six Detroit Electric Body Types—Two Chassis

## All Models Worm Driven Except One

WITH the manufacturing department of the Anderson Electric Car Co., Detroit, maker of the Detroit electrics, so situated that it will be possible to begin shipment of the 1915 models several months earlier than ever before, the concern is enabled to make an announcement of the details of these new cars at this time. No radical changes are made in the principles involved in the construction of 1915 cars as compared with the 1914 output, indicating that the Anderson company feels that it has arrived at a standard construction of approved excellence.

### Five Worm-Drive Models

The 1915 Detroit electric offering will be six body types, five of which are mounted on a chassis of 100-inch wheelbase, while only one of them, a four-passenger rear drive brougham, is fitted to a chassis with 94-inch wheelbase. All of the models on the longer wheelbase have worm drive with the worm underneath the wheel and their battery is slightly larger capacity than that of the other model, which is fitted with a bevel gear rear axle. Wood wheels, with either Goodrich Silvertown cord or Motz cushion tires, or wire wheels, with Silvertown cord tires, are optional.

Prices are practically the same as they were, although due to greater refinement and finish they are in some cases slightly higher. Model 50 cabriolet is priced at $2,650 with lead battery and $3,530 with Edison battery; model 51, four-passenger brougham, at $2,850 with lead and $3,730 with Edison; Model 52, duplex-drive, five-passenger brougham, at $3,000 witih lead and $3,880 with Edison; model 53, forward drive, five-passenger brougham, at $2,950 with lead and $3,830 with Edison; model 54, rear drive five-passenger brougham, at $2,950 with lead and $3,830 with Edison; and model 55, rear drive four-passenger brougham with lead battery at $2,600. The last-named, model 55, is the 94-inch wheelbase car and corresponds to last season's model 43 selling at $2,550. Model 53 corresponds to the $2,850 car of 1914, while the duplex drive model 52 is the same in price as the one it succeeds of 1914, and so on.

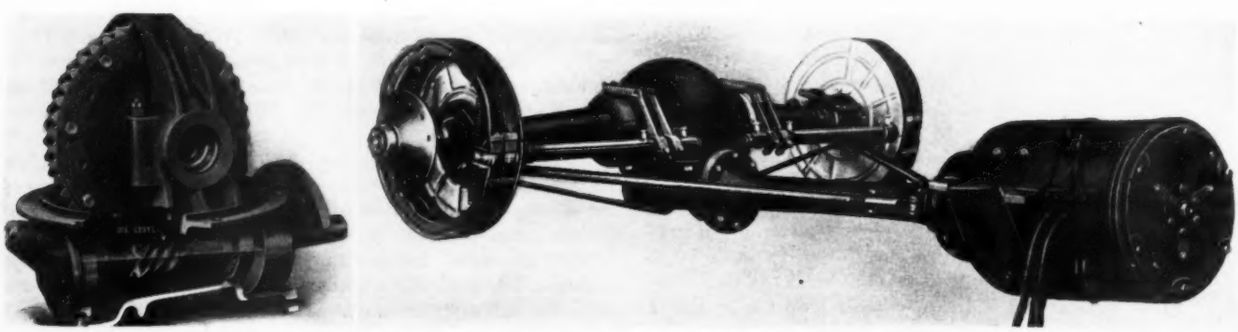
### Battery Capacity Increased

Battery capacity has been somewhat increased, and though the number of cells is the same as last year, the number of plates per cell has been increased from 13 to 15, this referring to the lead batteries. That is, the 100-inch wheelbase cars have 42 cells of 15 plate type instead of 13 plate, while the 94-inch has 40 cells, also 15 instead of 13 plate.

A new feature of importance is the metal compartment ahead of the motor and accessible through a trap door in the floor, in which is mounted the controller mechanism, brake on the head of the motor, the Klaxet horn, which replaces a bell as a warning signal, the ammeter shunt and the throw-over switch used to change the lighting connections from one-half of the battery to the other. The trap door is fastened in and prevented from rattling by rubber rollers. For additional protection, the controller has an extra cover of its own which can be removed by loosening two clips. To remove the controller from the car it is only necessary to disconnect the cables and remove three screws, when the controller can be lifted bodily through the trap door.

Due to this new controller location and also to a new scheme of wiring whereby all wires are led to a terminal board provided under the left end of the rear seat and all wires leading up from the chassis and down from the body are connected to numbered positions on this terminal board, it is a very easy matter to take the body from the chassis without in any way disturbing the wiring.

Detroit electric bodies, which are constructed entirely in the



Left—Lanchester-type worm gear used in the Detroit electric. The worm runs in a bath of oil. Right—Drive unit, showing underneath worm and inclosed propeller shaft

Left—New Detroit cabriolet with wire wheels, which are optional. Right—Duplex-drive five-passenger Detroit electric brougham selling at $3,000 with lead battery

company's shops, are examples of the highest art in coach work and are even more refined than in the past. The door windows are sashless and fitted with a new type of window lift to replace the hand lifting by means of straps. It is merely necessary to turn a small nickel-plated handle to raise or lower the glass the desired amount.

As an illustration of the refinement to which the body construction has been carried, aluminum drip moldings have been placed over the doors to prevent water from dripping upon those entering or leaving the car on a wet day. Door panels are of solid sheet aluminum with moldings pressed in, thus entirely eliminating the separate moldings formerly used. The window sashes are all metal covered, eliminating the possibility of checking or warping.

Steering continues to be by means of a horizontal lever mounted parallel with the control lever, the latter being operated by the left hand and when advanced accomplishes the forward or reverse movement of the car. In reversing, the control lever is first brought to neutral position, raised slightly until it comes in contact with a stop, and then advanced in the usual way. When brought back to neutral again after reversing, it automatically drops into normal position for running forward, making it impossible to start the car backward when it is desired to go ahead after having reversed the car.

### Interlocking Emergency Cut-Out

There are two brake pedals, each of which operates independently a pair of internal expanding brakes on the rear hubs. Between the brake pedals is a third small pedal which operates the emergency cutout switch and sets the brake ratchet. A pressure of the foot on the three pedals at once cuts off the power, regardless of the position of the control lever and locks both hub brakes. It is then impossible to release the brakes until the control lever is returned to its extreme backward position. A Yale locking device is also provided.

In the duplex control models, the interlocking cut-out feature also prevents starting the car from either driving position unless the pedals are in position to operate from that seat. In these models providing drive from either seat, there are two sets of steering and control levers and two sets of brakes. The operation of shifting pedals from one driving position to the other has been simplified. This is accomplished by pushing forward the small lever at the side of the front steering mast head, which releases the brake pedals so that they can be pushed with the foot flush with the toeboard. This automatically locks the pedals which have been pushed down and raises the other set of pedals to the operating position.

As heretofore the battery is carried in front and rear compartments and the jars are of the high ribbed type, making it unnecessary to wash the plates. Mileages of from 50 to 85 miles per charge are obtained. There are in the 100-inch wheelbase models eight trays placed lengthwise of the car, four under the front hood and four under the rear.

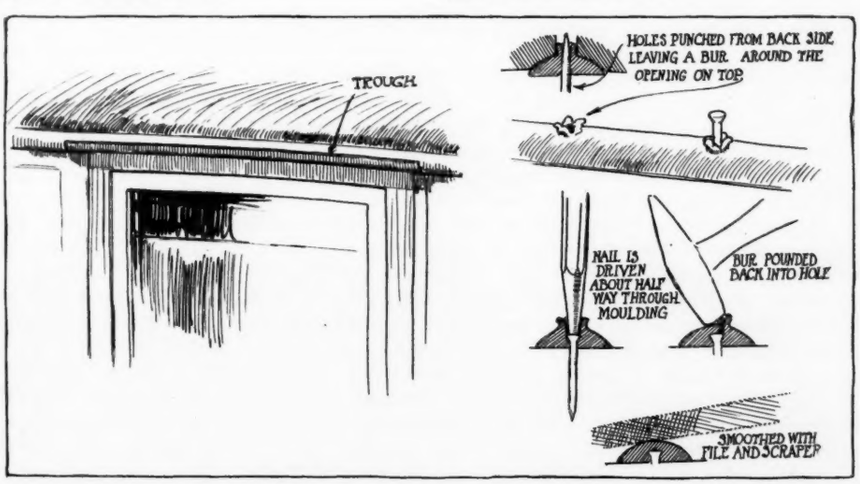
The drive system is practically the same as it was, the motor, torsion tube and rear axle being in unit. The motor is series wound and is said to have high torque characteristics and very low internal resistance. It is held on the under side of the supporting rails by large steel bolts so that it may be released and easily lowered to the ground.

### Lanchester Type Worm Used

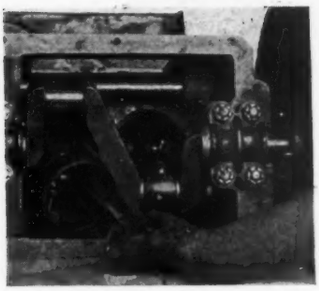
The Lanchester type of worm gear which is used on all the models excepting the one mentioned is of the type in which the worm is below the wheel and runs continually in a bath of oil. Axles are floating, while the housings have been somewhat re-designed in order to give them greater strength while reducing the weight.

The brakes used have been improved by the addition to the drums of stiffening flanges. Both brakes are internal expanding and measure 16 inches in diameter by 1 1-4 inch width.

(*Continued on page* 679)


TROUGH
HOLES PUNCHED FROM BACK SIDE LEAVING A BUR AROUND THE OPENING ON TOP
NAIL IS DRIVEN ABOUT HALF WAY THROUGH MOULDING
BUR POUNDED BACK INTO HOLE
SMOOTHED WITH FILE AND SCRAPER

Left—Aluminum drip moulding placed over the doors of Detroit electrics to insure dry entrance and exit on a rainy day. Right—How the nails are concealed in applying mouldings to Detroit Electrics



# The Rostrum

## Advocates Engines Running Over 1,500 R.P.M.

*EDITOR* THE AUTOMOBILE:—*I have just read the article by a British writer, on the slow and high-speed engine, published in your September* 10 *number, page* 490, *but cannot agree with his views. It is true, of course, that the measure of efficiency in an engine which has to propel itself, as is the case with an automobile or aeroplane engine, is the ratio of its power to weight, but it hardly seems credible that the author can believe that the highest results can be obtained with an engine running* 1,500 *revolutions per minute; for if he but look at any of our recent high-speed engines he will receive a surprise. Take for example the Deltal engine described some time ago in your columns. This engine develops about* 90 *horsepower at* 3,000 *revolutions per minute and weighs* 570 *pounds with carbureter and magneto. This is* 1 *horsepower for every* 6 1-3 *pounds.*

*I would like very much to see an engine of any piston displacement whatever which can produce this ratio of power to weight at* 1,500 *revolutions per minute.*

*Nor is the above engine of the double-valve, over-head type which has shown even better results in racing. It is merely a large-valve, L-head type of good design.*

*As to aeroplane engines running at about* 1,500 *revolutions per minute, this is because these engines are run most of the time at nearly their maximum power and it is not advisable to run an engine where such extreme reliability is required at* 3,000 *revolutions per minute even though modern engines are very reliable at that speed. In an automobile, however, it is desirable to have an engine capable of extreme speed and power when such may be needed, even though the engine is not regularly run at such extreme speeds. Also, the modern, high-speed engine, which gains its power by large valves and not by extreme valve timing, will not show much if any difference in power compared with the low speed type at* 1,000 *revolutions per minute.*

*Southport, Conn.* EDWARD G. INGRAM.

## Reader Gives Views on Modern Gas Engine Design

EDITOR THE AUTOMOBILE:—This subject should interest those contemplating a change in their power plant and will aid those who attempt to solve the problem of making a purchase by a study of numerous designs as displayed in the many trade papers.

I note that there are something like 200 different motor designs with no two alike. There is also a total lack of similarity in power rating for a given bore and stroke. There are high-speed, medium-speed, and low-speed, sometimes called high-duty or heavy duty for a given horsepower. The price is generally high and the weight is generally heavy. The term is a very vague and misleading one and any prospective buyer to insist on such an installation for a speed boat would be considered joking. High whether used in connection with speed or power means the same. Consider an engine with, say, three cylinders 5 by 5, at 800 revolutions per minute. It develops 25 horsepower and weighs 500 pounds. It may be a heavy engine compared with another of the same power or where three cylinders 4 by 4 at 1,200 to 1,300 revolutions per minute develops 28 horsepower. In the latter case we have high power with light weight and this is a most desirable power plant for a boat outside of a heavy fishing boat with full lines and where weight is not a detriment.

There is also another perplexing consideration and the more the average novice studies catalogues and sectional cuts the more confused he gets and the more convinced is he that there are no fixed laws governing engine design as applied to the two-cycle marine engine at least. The most amusing part of it is how one concern will claim a decided advantage for a feature another will condemn. The detachable cylinder head feature is one so amusing to me that I fail to see how some concerns can muster sufficient nerve to blow about a feature others avoid and in doing so resort to all kinds of intricate castings besides adding to the cost of machining the bore with a closed end. This is true in the highly developed standard automobile designs. There are, however, some exceptions. For structural reasons a solid head would be impracticable, as in the silent Knight or engines with valves in the head; and some of those prefer to use valve cages rather than add a needless joint at a point where the jacket is most essential, when otherwise surplus metal to retain studs would restrict the circulation besides tending to distort the bore by unequal expansion.

Personally I prefer to increase the volume of water space at the head and reduce it to the practical limit at the lower end, this reduces the tendency to form a rib where the jacket stops on the bore and aids circulation by convection.

Carburetion is getting to be a problem due to low-grade gasoline and while the automobile engineer has ideal conditions due to an inclosed engine kept warm by its own heat no car is considered up to date that does not make provision to heat the charge leaving the carbureter by some means and all modern carbureters are provided with an attachment to heat the primary air by means of a sleeve fastened to the

exhaust pipe connected by a tube or flexible pipe and yet there is a painful absence of any marine engine so fitted, to combine the inlet and exhaust pipe does seem the logical method of retaining a mixture after it leaves the carbureter were it not for the fact that the exhaust pipe is not the same temperature at any point compared with that of some other. If we take a three-cylinder, the charge entering the cylinder at the end (outlet) of the exhaust pipe comes in contact with the total heat of three cylinders, the charge entering at the middle cylinder comes in contact with that of two units, while that entering the other has a heat contact of the cylinder it enters only. This is a condition tending to graduate the density of the mixture into lean, medium and rich, which in turn causes no two cylinders to be of the same power and may account for backfiring in one or the other according to the adjustments used, or if a change is made to eliminate backfiring the over-rich cylinder will four-cycle, which is equally bad and wasteful. I would recommend that sufficient heat be absorbed by air entering the carbureter to make and retain a uniform charge of such a nature that condensation is prevented.

The dangers arising from the backfiring bug-a-boo while real are simply due to a lack of sufficient fuel rather than a defect in design. If we trace the cause of the backfiring we will find regulation will stop it. This may be done by enriching the charge or by the more logical method of air scavenging the cylinder.

Cleveland, O. JAMES MCINTOSH.

## Description of Delco Circuit-Breaker

Editor THE AUTOMOBILE:—Will you please explain what the circuit breaker on the Delco system is for and how it operates?

Chicago, Ill. H. M. W.

—The circuit breaker used in the Delco system is for the purpose of interrupting the circuit between the source of current supply and the lamps, etc., when a wire becomes grounded. The source is the storage battery or the generator, depending on which happens to be furnishing the current.

It consists of an electro magnet with a single winding and it opens and closes the circuit leading to the lamps, horn and ignition through contacts A, Fig. 1.

When there is a ground or short circuit in one of the wires, it causes an excessive flow of current which goes through the winding of the circuit-breaking relay. The increased current produces a magnetic pull between the pole piece B and the armature C, which in turn causes the extension D of the armature to give a hammer blow effect on the point E and cuts off the current supply. The opening of the contact kills the magnetic pull between the pole piece B and the armature C and the contacts close again, but are opened as soon as contact is made. The relay will continue to vibrate until the ground or short circuit is removed. The spring F is for the purpose of holding the armature away from the pole piece.

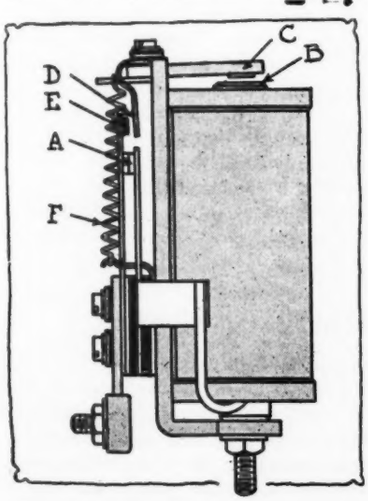



Fig. 1—Delco circuit-breaking relay which insures against short-circuits

A current of approximately 25 amperes is required to trip the circuit-breaking relay, but after it is in operation a current of approximately 5 amperes will cause it to continue vibrating until the ground or short circuit is removed.

The function of the relay is the same as that of a fuse except that it eliminates the necessity of replacing fuses or fuse blocks.

## How to Wire Master Vibrator

Editor THE AUTOMOBILE:—Will you please give me an illustration showing how to connect a master vibrator to a four-way coil on a 1914 Ford?

Ilion, N. Y. R. B. FISK.

—A typical wiring diagram is that of the K-W Master vibrator shown in Fig. 2. The wiring diagram is easily understood. The master vibrator is mounted in a convenient place on the dash, either at one side of the coil or directly on it. The usual place is just above the steering post on the left side of the dash, as shown in the diagram. The switch of the vibrator is used to start and stop the motor, and the switch on the coil is thrown over on the lead that connects to the master vibrator. None of the timer leads or spark plug wires are disturbed.

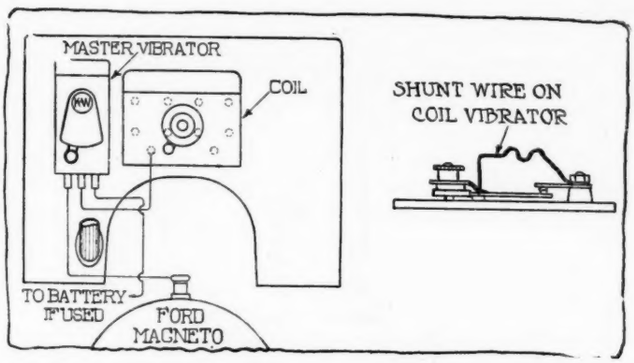



Fig. 2—Left—Diagram showing master vibrator attached to Ford. Right—Shunt wire for short-circuiting individual vibrators

It is important that the vibrators on the coil be short-circuited, either by screwing them down tight or by bridging them with copper wires, the latter method is better. This is done by attaching a small copper wire, as shown in the corner of the illustration.

## How Rotary Valve Is Timed

Editor THE AUTOMOBILE:—In your issue of September 24, page 581, Mr. Furst asks about timing a rotary valve engine. Your reply does not coincide with my experience with those engines, so I take the liberty to reply. A rotary valve which turns at half crank speed is a very fast valve and so opens quicker than the usual poppet valve, and on this account does not need to be opened so early. Of course, much may depend on the design of the valve, but such engines as I have built with rotary valves had this advantage. One of them was exhibited at the New York show in 1907. A recent table published in the *Motor Age* gives the timing of sixty engines and the average, as I remember it, is about as follows: Exhaust opens 45 degrees before center and closes 8 after, followed at once by the inlet opening. The time of closing of the inlet is not a matter of valve but of pipe. If the inlet pipe is long, the valve should remain open long, because the gases once started in the pipe will continue to ram in for an appreciable time. With the above timings Mr. Furst will get good results and high speeds if his valve is properly proportioned. The rotary valve gives not only

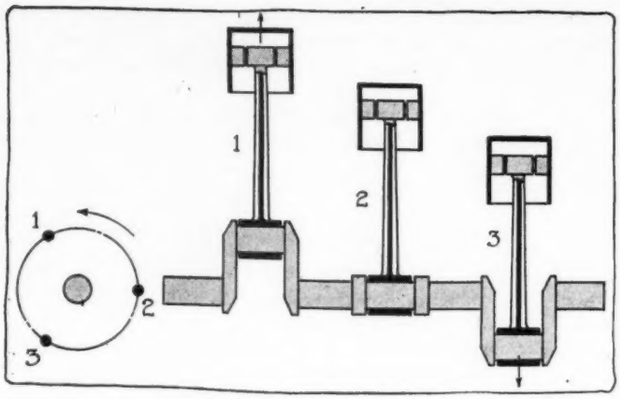



Fig. 3—Diagram showing inertia forces tending to rock a three-cylinder motor

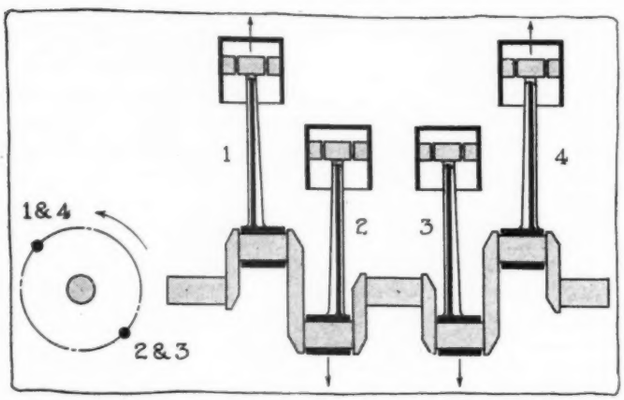



Fig. 4—Diagram showing that in the four-cylinder motor the inertia forces are balanced and there is no tendency to rock the motor

a quick opening but the passage is nearly straight and this lets the gases pass freely and fast.

Philadelphia, Pa. CHAS. E. DURYEA.

## Why Not a V Six-Cylinder Motor?

Editor THE AUTOMOBILE:—1—Why was a three-cylinder, four-cycle engine never marketed in an automobile?

2—Would it be practicable to build a six-cylinder engine V shape such as the new Cadillac, but with a three throw crankshaft? If not, what would be the disadvantages?

3—What is the object of automobile manufacturers putting out their new models in Midsummer and Fall instead of Spring?

The farmer is a big factor in buying automobiles today and he would rather buy in the Spring than Fall because he gets little use of a machine in Winter. A new machine bought in the Fall would stand unused nearly all Winter and when Spring comes he hesitates on buying because he knows that there will be new models out in a few months. The early Spring is the time most people get the automobile fever worst.

E. St. Louis, Ill. A SUBSCRIBER.

—1—The objection to the three-cylinder motor is that it is subject to rocking in a longitudinal direction due to the unbalanced moments produced by the inertia forces incident to the reciprocation of the pistons and connecting-rods. Also, while the power impulses may be evenly spaced, they do not occur with sufficient frequency. It has generally been conceded that four cylinders is the minimum.

In understanding the lack of balance in the three, consider first of all the inertia force produced by a single piston and connecting-rod. When these masses are increasing speed, there is a reaction on the motor in the opposite direction to the motion and when they are decreasing speed, there is a reaction in the same direction.

For example when the piston is starting from top dead center its acceleration produces an upward pull, while when it is slowing down, as it nears lower dead center, a downward pressure is exerted. On the up-stroke, the acceleration of the piston causes a downward reaction on the motor and when it slows down near the end of the stroke an upward force is created.

Therefore when the piston is above mid-position the pull is upward and when below, downward. With number two piston and connecting-rod half through the stroke, number one is just beginning and number three is ending the down stroke. There is an upward pull on number one, zero pull on number two and a downward pull on number three, as shown in Fig. 3. One-half revolution later these forces are reversed and the tendency is to rock the motor in the opposite direction.

In the four, all-in-line six and V-type eight this tendency to rock is not present because the moments are balanced. This is shown by Fig. 4. In this motor, which is typical of all four-cylinder designs, the reciprocating parts are symmetrically arranged. When the piston in number one cylinder moves down, so does that of number four. Likewise, when number three piston goes up, number two does also. Therefore, if there is an upward inertia force due to number one there is an equal upward force due to number four. Also, the downward force of two is matched by that of three. The result is that no rocking can take place.

2—The same lack of balance in the three is also present in the six-cylinder V-type, which is merely two sets of three with a 90-degree interval between them. The six also has the disadvantage that the explosions are unequally spaced. With the crank throws 120 degrees apart and two connecting-rods attached to each throw, the explosion will occur alternately at 90-degree and 150-degree intervals.

One advantage of this type of motor, however, would be a shorter overall length and a shorter crankshaft, and camshaft, but the cam followers would be more complicated.

3—There are several good reasons for this practice. Manufacturers from year to year have brought their models out earlier in order to be the first in the field and get the lion's share of the business. Also, when Midsummer comes a man that is in the market for a car hesitates to buy one of this season's models because the year is half over; he would rather wait and get a machine built for next year's trade. If some of these new models are available in the Fall he will buy, but if not, he will wait until Spring. Thus, the Fall is converted into a good selling season. In addition, closed cars are now used more than ever, with the result that there are a great many sold in the Fall. People buying these cars, however, would probably defer purchase in a great many cases, if they could not obtain new models.

Thus it is seen that instead of the selling season being confined to the Spring months it is now spread fairly well throughout the year, by this policy. This facilitates production and allows the manufacturer to operate at a more nearly constant rate, instead of rushing manufacture in the Winter and Spring and closing down in the Summer, as used to be the case.

## Circulation Stopped—Motor Heats

Editor THE AUTOMOBILE:—1—I have a model 10 Buick and am experiencing quite a little trouble with the cooling system. After running for a few minutes the water boils away rapidly. The radiator inlet pipe becomes very hot as does the extreme top of the radiator. The rest of the radiator remains cold and the outlet to the pump, as well as the pump remains cold. I have had the pump apart and it seems in good order. The radiator drains out all right.

2—When running on high the car occasionally indulges in back jumping and I suspect the clutch or the planetary transmission. It seems to occur most frequently when the throttle has just been opened a slight amount. It has a Schebler carbureter, well-adjusted and the newly fitted Bosch, independent magneto gives perfect ignition.

Hollis, L. I. R. M. DE VIGNIA.

—1—Either your pump is not working or the cooling system is stopped up. The fact that the pipe running to tne radiator is hot and the lower part of the radiator and the piping to the pump is cold, shows that there is no circulation. Look for loose pieces of hose or dirt in the piping; see that the radiator is clean and examine the pump once more.

2—Due to wear in the bushings in the interior of the mechanism, the three fingers that engage the clutch are now too long and should be shortened by 1-8 inch by bending them that amount. Then adjust the clutch by the turnbuckle under the floor boards. First pull the hand lever back until it clicks, there being a notch with which it registers at this point. Then tighten the turnbuckle until the clutch just begins to take hold.

## Increase of Tire Pressure with Heat

Editor THE AUTOMOBILE:—1—Kindly forward to me figures regarding the increase of tire pressure per degree of heat.

San Diego, Cal. H. F. WHITE.

—The increase in pressure for a given rise in temperature can be calculated by the formula:

$$P = \frac{P_1 (459 + T)}{459 + T_1}$$

Where $P_1$ = the initial pressure
$T_1$ = the initial temperature
$P$ = the final pressure
$T$ = the final temperature

P and $P_1$ refer to the absolute pressure—which is merely the sum of the gauge pressure plus atmosphere, or 14.7 pounds.

If the pressure to which the tire is inflated is 60 pounds and the temperature is 60 degrees then if the temperature should rise to 100 degrees, the new pressure may be calculated by substituting in this formula.

$$P = \frac{60 (459 + 100)}{459 + 60} = 64.7$$

This represents an increase of 4.7 pounds..

## Why Advance Spark Means Economy

Editor THE AUTOMOBILE:—1—Please publish in your paper where the Rayfield cyclecar is made?

2—Why does a car run on less gasoline with the spark advanced.

3—What is the advantage of a spark lever?

Marathon, Iowa. O. A. SMITH.

—1—Rayfield Motor Co., Fisher Building, Chicago, Ill.

2—This is only partly true. There is a limit to the amount the spark can be advanced to improve the economy of the motor. The spark lever should be set so that the greatest power is obtained from the charge. This means that it should merely be advanced to this point. Further movement will cause a decrease in economy. Under a given set of operating conditions the economy is greatest when the motor is operating most efficiently.

Figs. 5, 6 and 7 show three indicator cards, the one at the top showing the effect of very early ignition, the middle one, point of best ignition, and the lower one too late position of the spark. The horizontal distance represents the piston stroke to a certain scale and the vertical distances the pressures in the cylinder at various piston positions. The cross indicates the position of the spark in each case.

It will be noted that the center diagram has the largest area and, as the area is proportional to the power developed, it will be seen that this diagram indicates the greatest power development, or, under a given set of conditions, this position of the spark is the best for economy.

The spark occurs just before the piston reaches the top of the stroke, combustion takes place almost immediately and the pressure rise is indicated by a line that is almost vertical. About the time the pressure has become a maximum, the piston has started out on the power stroke and expansion begins.

With the spark advanced too far, as shown in the upper diagram, the area is reduced. The spark in this case occurs considerably before the piston has reached the top of the stroke, with the result that the explosion line is farther to the left. Nor is it quite straight because the piston is moving fast enough at this point so that it moves an appreciable distance while combustion takes place. Since the pressure rise is probably completed before the piston gets to top dead center, the gas is slightly compressed during the completion of the up-stroke. This may form a slight loop at the apex, as shown.

When the spark is retarded, the piston has already started on the expansion stroke before the ignition takes place. This causes the compression line to double back on itself until the point of ignition is reached when there is a rapid rise of pressure. The top of the card is rounded off, however, due to the acceleration of the piston.

3—The spark lever is for the purpose of enabling the operator to set the time of ignition at will to give best economy and power.

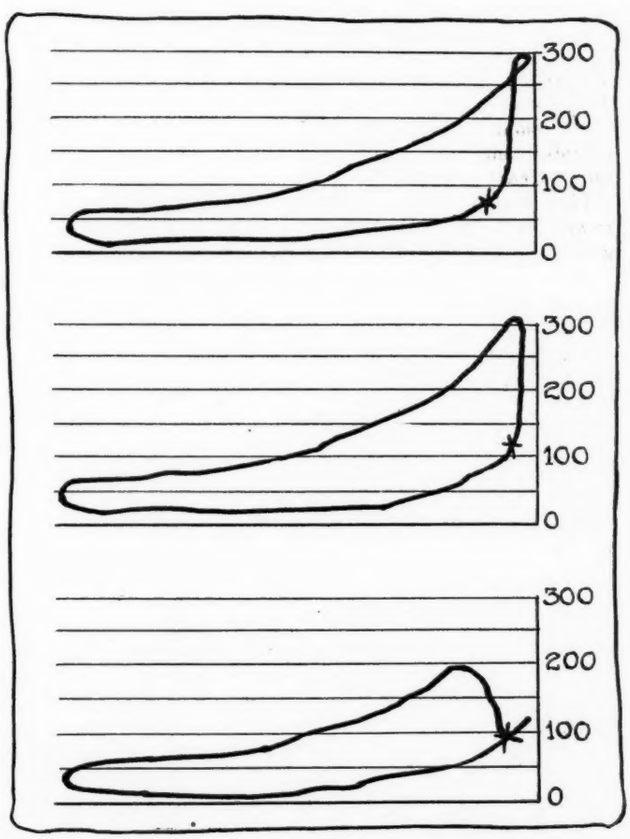
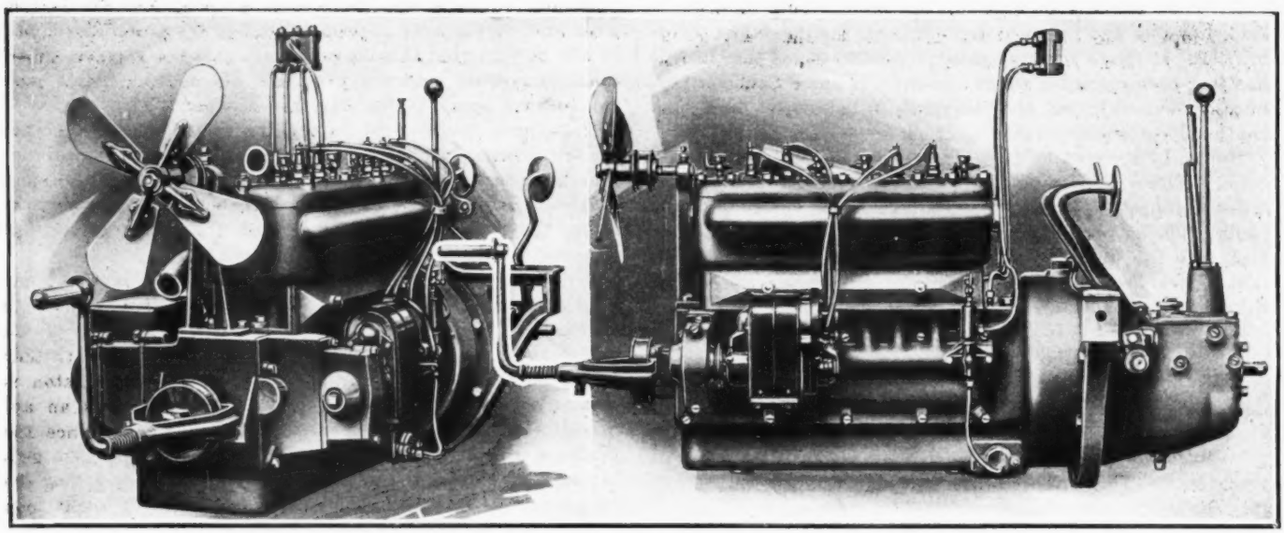



Fig. 5—Upper—Indicator card showing spark advanced too far and consequent reduction in card area

Fig. 6—Middle—Spark properly timed and occurring slightly before dead center. This position gives a maximum area

Fig. 7—Lower—Spark very late. Showing the reduced area and consequent loss of power



Left—New small-car motor showing the general construction. Note the method of supporting the crank handle by means of a yoke. Right—Left side of new power plant illustrating the mounting of the magneto, and the oiling system

# G. B. & S. Small Car Unit Power Plant

## Weighs 392 Pounds—Easily Installed—Bore 3¼, Stroke 4¼—Detachable Cylinder Heads

ON October 1 the Golden, Belknap & Swartz Co., Detroit, starts production of a new powerplant adaptable to small-car installations. This is called model D and its total weight with gearset, clutch, magneto, motor-generator and carbureter is 392 pounds.

Like previous designs of this make, model D is a unit power plant type arranged for three-point suspension. The gearset bolts to the flywheel housing. The rear motor support with an arm extending for attachment to each side member of the frame is interposed between the flywheel and gearset housings as in former G. B. & S. practice. A special point is made of the simplicity of the application of the motor to any small chassis. It requires only the drilling of one hole through each side of the rear motor support and the insertion of two bolts when the motor is swung in the car frame ready to attach the drive shaft, the front end of the motor fastening with two bolts to a front cross-member of the frame.

The motor, 3 1-4 by 4 1-4 inches, has the cylinders cast in block with valves on the left. The horsepower rating is 17 at 1,000 r.p.m. with 141 cubic inches piston displacement.

### Detachable Cylinder Heads New

New to G. B. & S. construction is the detachable cylinder head which is in the form of a single plate securely held in place by steel bolts and exposing all valve pockets, valves, piston heads and cylinders when removed.

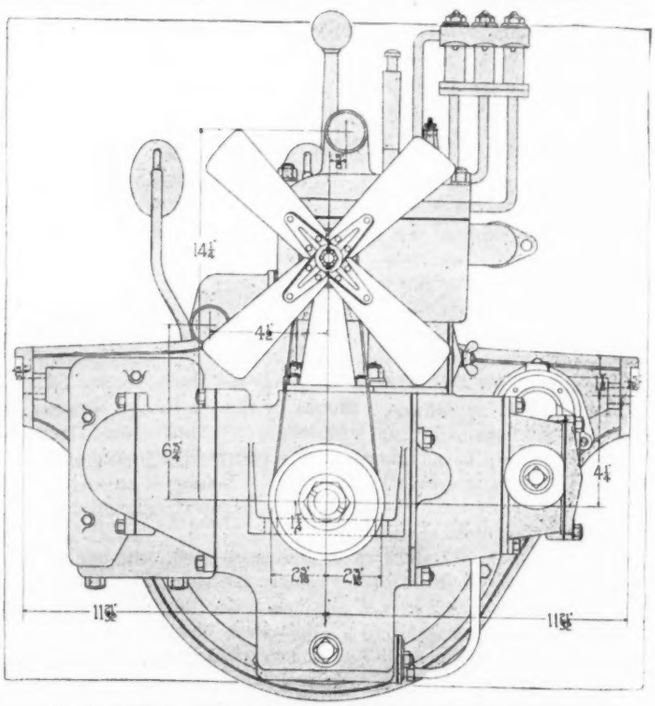
Valves are completely inclosed by a plate readily removed by unscrewing two wing nuts. The valves have cast-iron heads with steel stems. The crankshaft has three large main bearings of nickel motor babbitt.

### Silent-Chain Drive

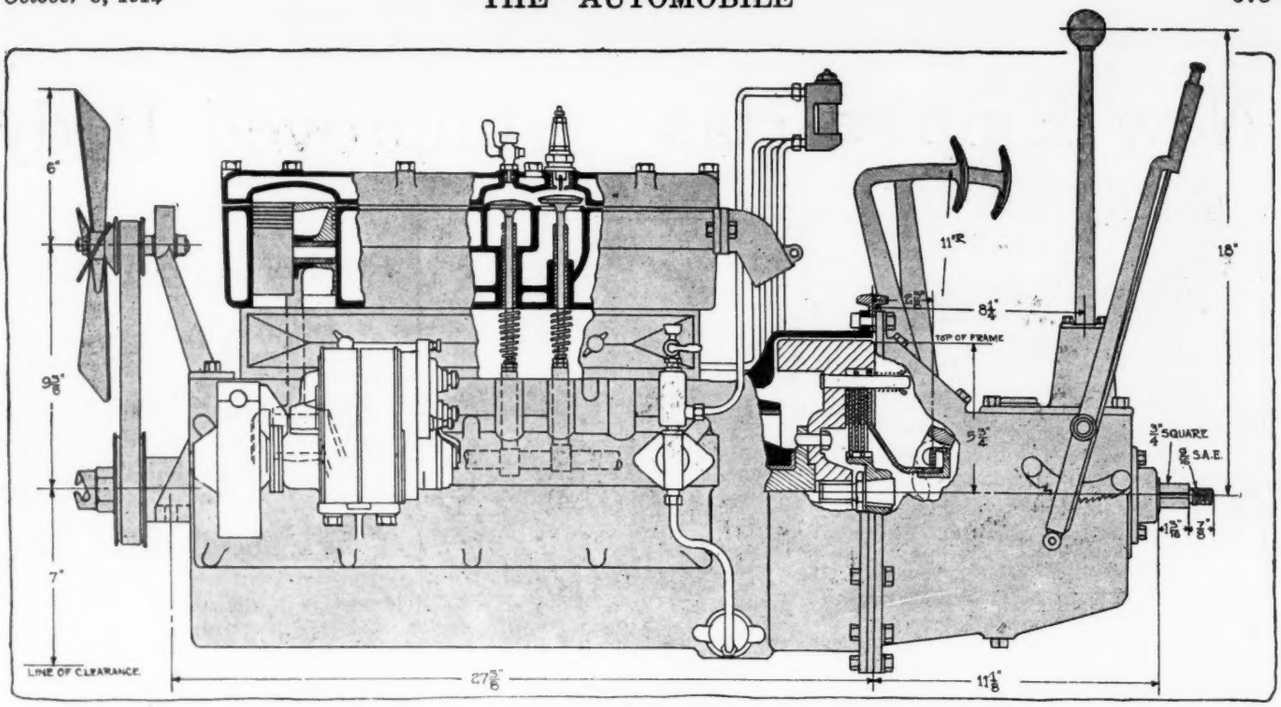
A noteworthy feature is the use of silent-chain drive for the camshaft, magneto shaft and generator shaft. These run in a bath of oil, being completely housed at the front of the motor, and may be adjusted by the insertion of shims of varying thicknesses between that portion of the housing carrying the magneto or generator shaft sprocket and the main housing, this serving to slightly increase or diminish the distance between chain centers. These special shims are furnished by the manufacturer.

The motor is arranged for thermo-syphon cooling with large water connections.

Lubrication is by a combination of force feed and splash.




Front view of motor with the principal dimensions given




Left side of motor partly sectioned and with the principal dimensions given. The overall length is about 44 inches

The motor is equipped with a force-feed oiler, operating from No. 4 exhaust cam. The oil is forced from the oil reservoir at the bottom of the crankcase to the three-feed dash dial, and thence through three pipes leading to the three main bearings. An oil level is maintained in the crankcase from which connecting-rod bearings and pistons are lubricated by the splash from the dipping of the connecting-rod ends.

**Motor-Generator System Used**

The magneto is carried on the left and symmetry and balance of accessories are obtained by placing the generator and starter on the right. The motor-generator which has been used extensively on this motor is of Apple make, but any one of the well-known makes may be fitted equally well in which the combination of motor and generator is made applicable. The ratio between generator and crankshaft is 2.5 to 1, so that either when cranking or when being driven for generation of current the unit travels 2.5 times as fast as the motor.

Fitted to the motor is a three-speed selective gearset. The power comes to it through a four-plate disk clutch, two of the plates steel and two faced with asbestos woven wire. Pedals and center control levers are a part of the assembly as furnished.

The principal dimensions of the power plant are:

Crankshaft front bearing—1 1-2 by 3 1-2 inches.

Crankshaft center bearing—1 5-8 by 2 1-4 inches.

Crankshaft rear bearing—1 5-8 by 4 inches.

Connecting-rod bearings—1 1-2 by 2 inches.

Flywheel diameter—11 3-4 inches.

Flywheel width—3 13-16 inches.

Crankcase bell housing diameter—12 by 14 inches.

Overall length of power plant from face of fan to end of drive shaft—44 inches.

Distance from center of holes of front support to center of holes in rear support—37 3-8 inches.

Distance from center of holes of rear support to rear of gearcase—11 1-8 inches.

Distance from rear of gearcase to end of drive shaft—2 1-16 inches.

Width of rear support—23 15-16 inches.

Crankshaft center to top of water connection—14 1-4 inches.

Crankshaft center line to top of fan—16 3-8 inches.

Crankshaft center line to extreme bottom of motor—7 1-2 inches.

Extreme width of motor exclusive of rear support—20 inches.

Weight without gearset, clutch, magneto, motor-generator and carbureter but with crankcase and oil base—285 pounds.

Weight magneto, motor-generator and carbureter—67 pounds.

Weight gearset and case, pedals and clutch—40 pounds.

Total weight power plant complete—392 pounds.

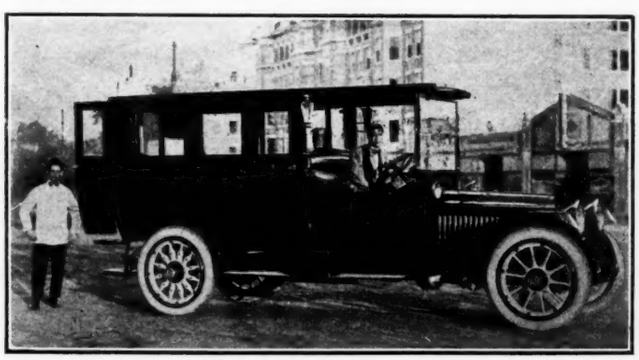
Valve diameter outside—1 13-16 inches.

Valve diameter clear opening—1 5-8 inches.

Valve lift—7-32 inch.

## Big Packard Ambulance for Newton, Mass.

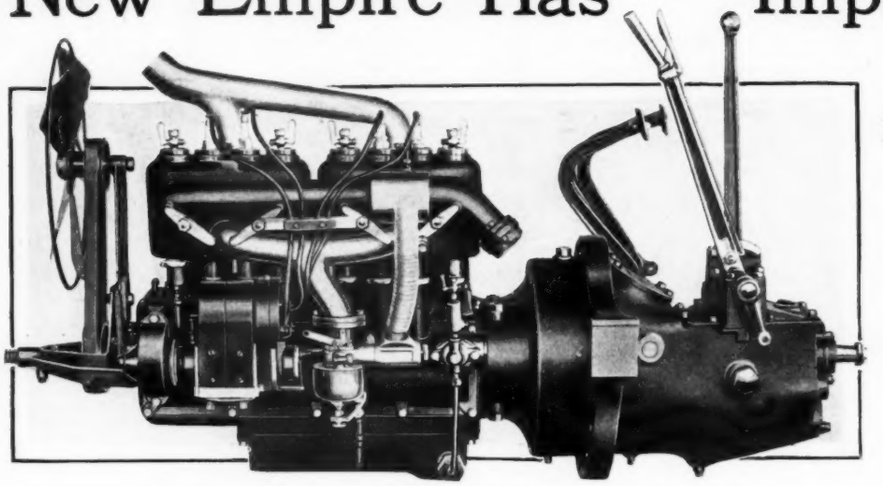
A luxurious ambulance has recently been delivered to a hospital in Newton, Mass., by the Packard Motor Car Co., Detroit, Mich. The ambulance is made up with a roomy closed body, electrically lighted, having ample windows for light and air, with doors on the side and rear and mounted on a 2-38 chassis. It has a gong, powerful searchlights, will climb almost any hill encountered on high gear, and is capable of great speed, with perfect comfort over rough going, a feature which doctors and nurses alike consider of prime importance.



Packard ambulance with roomy inclosed body

# New Empire Has Improved Body

## Price of Former Touring Body $50 Less— Line Comprises Two Touring Cars and a Roadster



Unit power plant employed on Empire standard chassis for 1915

WITH but few modifications the chassis made by the Empire Automobile Co., of Indianapolis, Ind., is the same as that employed for the past 3 years. The same body as that introduced for the 1914 season at $900 can now be purchased for $850. But, in addition to this, model 31-40, an improved streamline five-passenger touring car, is listed at $975. The streamline roadster, which corresponds to the latter in the two-passenger capacity, is sold at $875. In other words, the price has been cut $50 on the last year's design and a new five-passenger car added at $75 more than the car of 1914.

### Remy Electric System

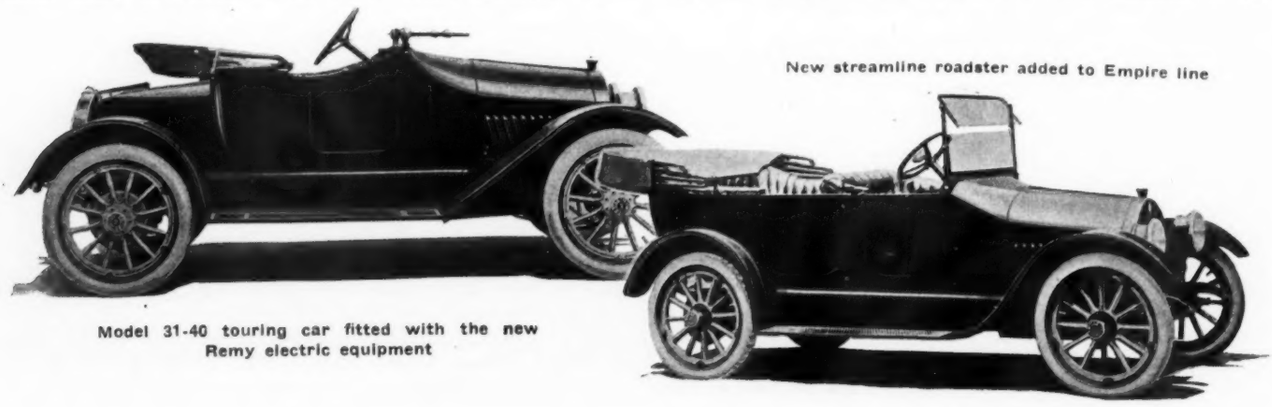
In bringing out this new design outside of the improved body work the most important change is the adoption of the Remy lighting, starting and ignition system. The mounting of this has of course caused minor changes to be made in the motor. But other detail changes have also been effected for this season. For instance, the oiling pump is now a horizontal instead of a vertical design and an oil pressure chamber is integral with the pump in order to maintain a steady flow to each of the leads. A priming cup is mounted on the oil pressure chamber so that in case the car has not been used for a considerable length of time, the pump can be primed to insure the delivery of oil as soon as the motor starts to run.

This season the fan post has been braced to increase its rigidity. A neater job has been made of the wiring, the latter being supported on the water outlet manifold. Improvement has been made in the clutch. Formerly the clutch adjustment was held by a number of steel plungers which fitted into holes in the clutch adjustment plate. These plungers were held in the holes by means of coil springs placed behind them. Now instead of the plungers, there are bolts, and when the adjustment has been made, the bolts are screwed down into the adjustment holes. This gives a much more positive adjustment lock than that provided by the plungers. Other than these minor details the chassis remains as it was.

### Right Steering Is Retained

A unit power plant suspended at three points including motor, clutch and gearbox is employed. The motor is a four-cylinder, L-head 3.75 by 4.5 unit, having a piston displacement of 198.8 cubic inches and stroke-bore ratio of 1.2. The cylinders are cast in pairs with separate manifolds, the water-jacketing space being large to take care of the needs of the thermosyphon cooling system. Unlike most of the motors for this season, the Empire has its valves all on the left side and this is accounted for by the fact that right steering has been retained.

Three rings and one oil groove underneath the lowest ring are used on the pistons. In the oil ring six holes are drilled to permit the oil sucked up by the pistons to return to the crankcase without being burned in the combustion chamber. These oil holes are .125 inch in diameter and are spaced equally around the circumference of the piston. The length of the piston is 3 9-16 inches. The diameter of the



Model 31-40 touring car fitted with the new Remy electric equipment

New streamline roadster added to Empire line

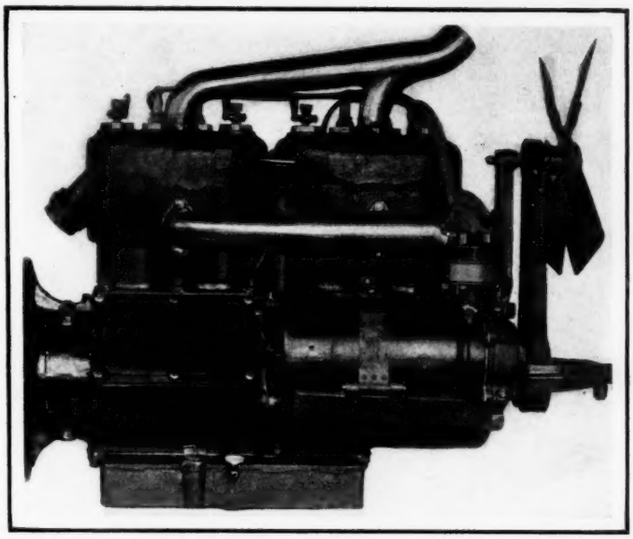
pin is .875 inch and the connecting-rod is an I-beam type.

Drop-forged crankshafts of high-carbon steel are used in all Empire cars. The diameter of the shaft is 1.75 inches and the shaft is finish ground to this size. It is carried on three bearings which are respectively 3.3, 3.3 and 4 inches in length from front to rear. These bearings are lined with white brass and have diameters of respectively 1.5, 1.5 and 1.625 inches.

Telescopic sleeves inclose what would be the exterior portion of the valve action. These sleeves can be raised, should it become necessary to adjust a tappet, by a single motion of the hand. In order to keep the tappets silent they are provided with fiber inserts. The valve action is driven from spur-type timing gears and the camshaft is a high-carbon steel drop-forging carried on four bearings. The valve diameters are 1.625 inches and the lift .3125. Nickel steel is used for the stems and cast iron for the heads.

### Combination Pressure and Splash Oiling

A combination force-feed and splash oiling system is used. One and a half gallons of oil are contained in the lower part of the crankcase and from the reservoir the oil pump delivers the supply of lubricant to a three-unit sight feed mounted on the dash. At this point the oil is divided into three independent leads and flows to the three main bearings. After overflowing from the main bearings the lubricant drains into the splash troughs where it is picked up by the connecting-rods and thrown to the interior parts of the motor. It is a constant level system, the oil overflowing from the troughs as soon as it has reached the desired height. By using the oil drain holes in the pistons a copious supply of lubricant can be splashed into the cylinders without fear of smoking caused by the burning of the oil in excessive amounts during the explosion stroke.



Side view of motor showing the installation of the new Remy single unit system for lighting, starting and ignition

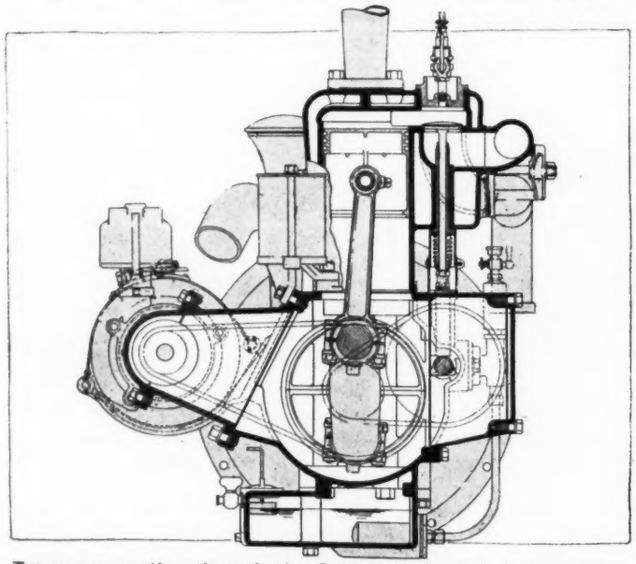
Special interest centers about the new lighting, starting and ignition system adopted by the Empire cars because it is a new product of the Remy factory. Known as model 129, it is a motor-generator outfit with battery ignition. The motor-generator is cylindrical in shape and is carried on the forward end of the motor, on the right side. A single armature with a compound winding operating at 12 volts performs the functions of a cranking motor and lighting generator.

When the starting switch is closed this unit operates as a compound-wound motor and turns the engine over at a speed of approximately 100 revolutions per minute until the engine fires. As soon as the engine starts running the unit becomes a shunt generator and at an engine speed of 350 revolutions per minute commences to charge the battery. At any speed above this the output curve of the generator remains flat at 6 amperes. The regulation is effected by means of a vibrator device which automatically increases and decreases the field strength of the generator. Both the relay and regulator are built upon an insulating block of bakelite and covered with a housing of the same material mounted on the engine side of the dash.

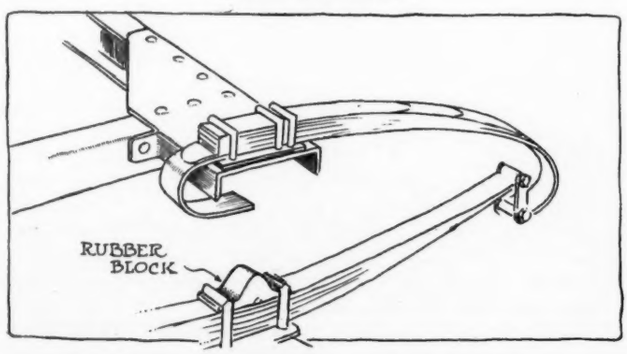
### Generator Fuse a Safety Measure

Protection is afforded by a generator fuse which is also fitted to the insulating block of the relay regulator for the purpose of protecting the generator should the battery become disconnected from the charging circuit. If the battery should become disconnected the fuse will burn out, thereby opening the field circuit, rendering the generator inoperative. The entire system is wired by the single-wire method and each lighting circuit is protected by an independent fuse. The operator may determine from his seat whether or not the tail light is burning because the dash lamp is wired in series with it.

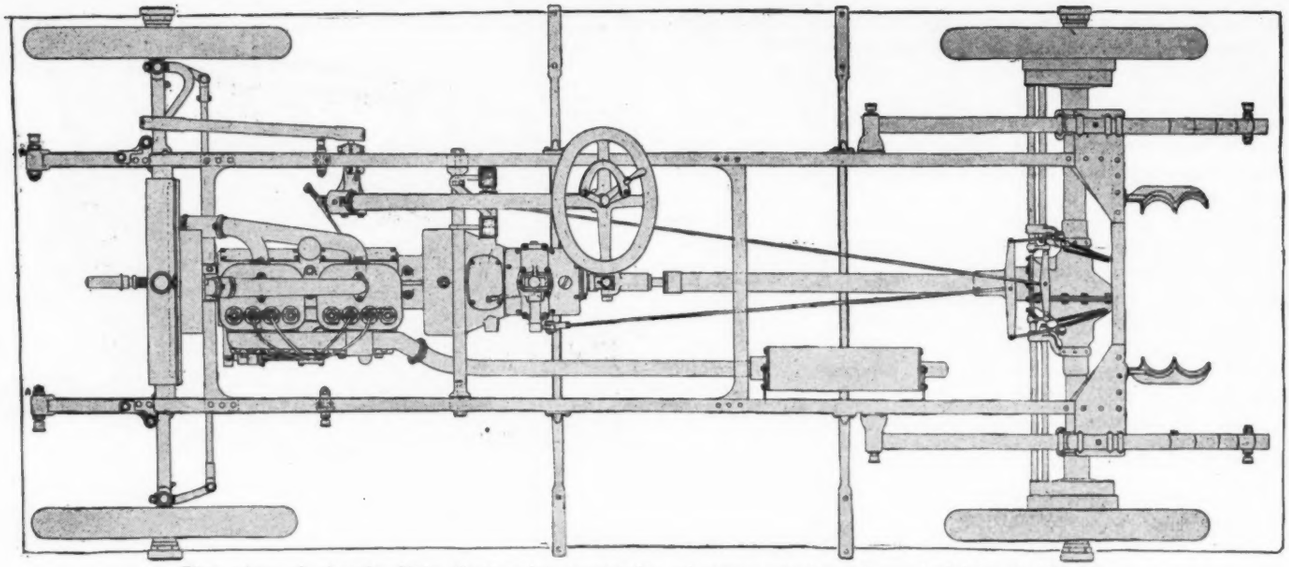
Ignition is by battery. Bakelite has also been used to good effect in the manufacture of the distributer. The construction of this system is such that the advance and retard motion does not move or oscillate the distributer and the wires attached thereto, thereby eliminating much of the chance of chafing and breaking the cable insulation. This system also operates at 12 volts and is designed throughout for that e.m.f. The coil is a special design for this voltage



Transverse section through the Golden, Belknap & Swartz motor used on Empire cars




Unique rear spring suspension a feature of the Empire

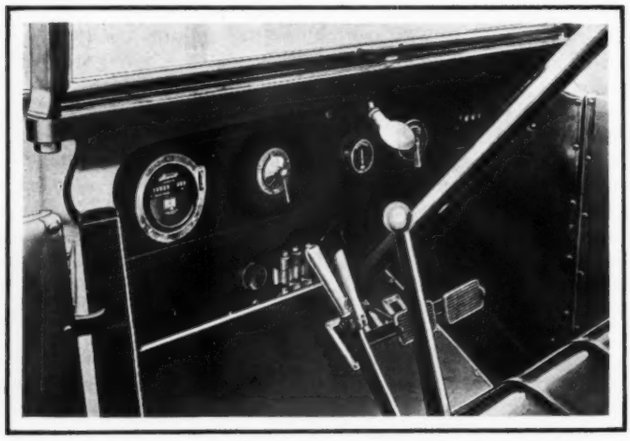


Plan view of chassis—Note three-point suspension of power plant and long straight brake linkage

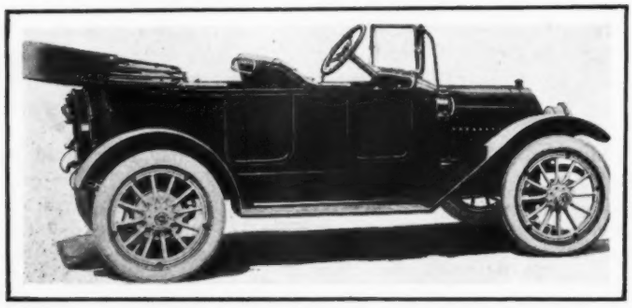
and has the advantageous feature of operating satisfactorily on a lower voltage should the output of the battery become low. The coil windings are heavily insulated and protected by bakelite.

The distributer segment arm, which is also made of the bakelite material, carries a safety spark gap to protect the distributer coil and high-tension cable. The circuit breaker is so designed that lag will be a minimum. In fact the makers declare that this has been altogether eliminated and that there is no time factor in the installation. A 12-volt, 50-ampere-hour, Willard battery acts as the current reservoir.

On the touring cars a 14.5-gallon gasoline tank is mounted under the front seat, giving a gravity feed to the Holly model-H carbureter. On the roadster bodies the tank is in the cowl and is of 12-gallon capacity, also providing a gravity feed. A 1.5-gallon reserve feature is incorporated in the touring car tanks. The carbureter is provided with hot-air intake and an air adjustment on the dash.



Dash showing mounting of control devices and instruments



Side view of model 31 touring car which has been continued with a $50 reduction in price

A disk and ring clutch is used. It has three 9-inch disks, two of which are faced with Raybestos fabric and the third, that running between the other two, is of steel. The entire clutch is housed within the unit plant and runs in oil. It may be reached however, very easily by removing a large hand-hole cover which is accessible by lifting the floorboard in the driver's compartment.

### Three-Speed Gearset

Three speeds are provided by the gearset. This is also accessible by a cover plate. The width of the gears across the teeth is .875 inch and on direct a final reduction between the motor and rear wheels of 4 to 1 is provided.

Only one universal joint is employed in the drive. This is mounted just behind the gearbox and is of the cross type. From this point the drive is taken through the steel shaft which is inclosed in a tube that is so constructed as to form a unit housing for the shaft and differential. The shaft is squared at the universal end and it may be quickly removed together with the rest of the entire rear system by removing the rear axle spring clips and detaching the brake rods.

The rear axle is a Weston-Mott semi-floating. The axle shafts are heat treated steel carried on heavy-duty Hyatt rollers. A noticeable feature in the axle housing is the utilization of a 3.5-inch sleeve bearing member which is hardened and ground. The axle carries a companion sleeve and the rollers bear upon these two members.

There are two sets of brakes. One expanding and the other contracting, acting on 12-inch drums on the rear wheels. The equalizers are mounted just forward of the rear axle. The brake linkage is distinctive in the employment of long, unjointed rods. The wheelbase is 110 inches, the tires 32 by 3.5 and the wheels twelve-spoke wood artillery.

The equipment on model 31, which is the held-over car, is practically the same as that on the model 31-40 except that acetylene lighting and magneto ignition are supplied instead of the new Remy outfit. Both cars have mohair tops, rain vision windshields, with a ventilating feature on the model 31-40, Stewart speedometer, etc. On the new car non-skid tires are provided on the rear.

# Apperson Adds New Four and Six

(*Continued from page* 667)

Equipment is full including a one-man top with dust cover and quick-adjustable curtains, rain-vision type of windshield, and full line of tools, lamps, license holder and so forth.

The two models which are carried over are known respectively as the 6-60 and the 4-45, the former being a six and the latter a four-cylinder design. These two cars are also similar in design but vary throughout in their dimensions. On the 6-60 chassis there are three lengths of wheelbase, 134 inches for the seven-passenger touring, 128 inches for the five-passenger and 122 inches for the roadster. These three cars sell at respectively $2,350, $2,200, and $2,200.

On the 4-45 there are two wheelbases, the touring car 120 inches and the roadster and coupé 116 inches. The prices on this are $1,685 for the touring car and roadster, and $2,350 for the coupé. Both cars have T-head block power plants, the dimensions of the six motor being 4.125 by 5 inches and those of the four, 4.5 by 5. In general chassis features they are the same as the two new cars which have been described. Both are equipped with the Bijur lighting and starting system, and have the single high-tension magneto ignition. They have the contracting band clutches, three-speed gearboxes, gravity gasoline feed, left drive and center control, and are fitted with bodies of streamline design. They are sold fully equipped.

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# Six Detroit Electric Body Types—Two Chassis

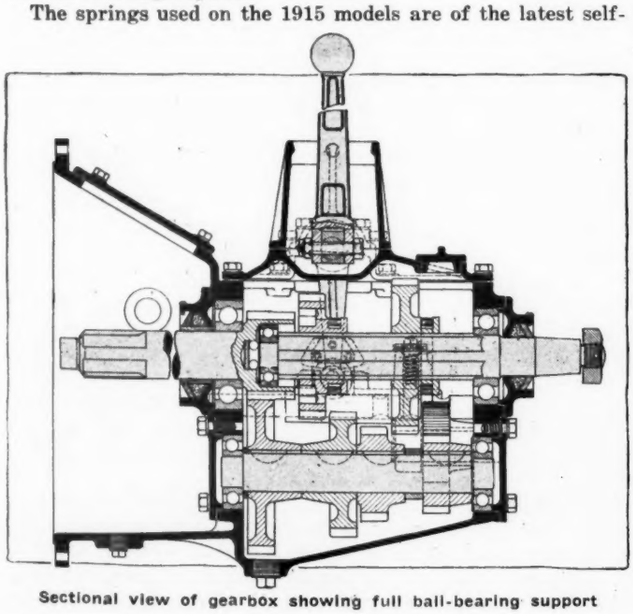
(*Continued from page* 669)

As regards the controller, this has been re-designed to give easier action and more perfect automatic lubrication, the drum segments being lubricated by felt wicks dipping into a reservoir of oil in the controller casing.

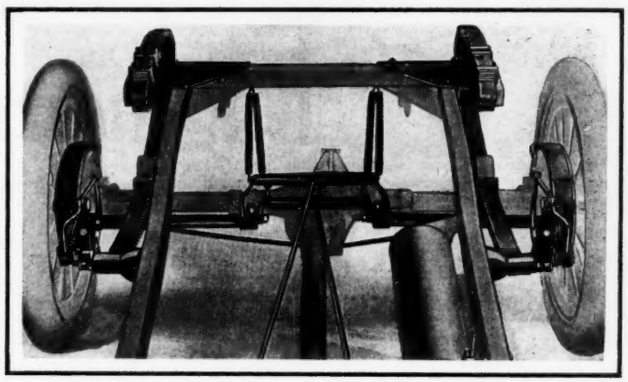
The controller affords five forward speeds, which are 5, 8, 13, 17 and 20 miles per hour. The control is of the double voltage system, the battery connection being changed by the operation of the controller so that a low voltage is applied to the motor for the first three speeds and a high voltage for the two high speeds.

The springs used on the 1915 models are of the latest self-lubricating type in the leaves of which small indentations or cups have been made, these containing lubricant which serves to prevent squeaking between the leaves.

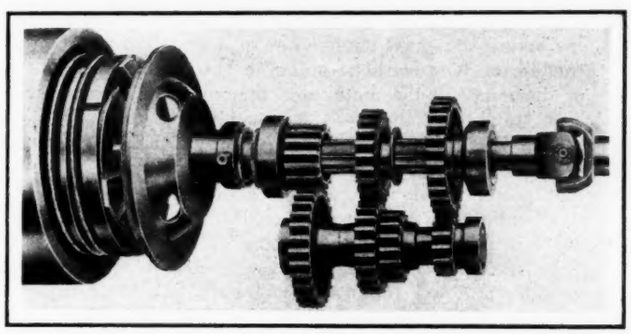
Another refinement is the use of battery hood props of a new design. Steel forgings which automatically drop into position and securely hold the hood raised, are used.



Sectional view of gearbox showing full ball-bearing support



Rear construction and equalizing mechanism on Empire

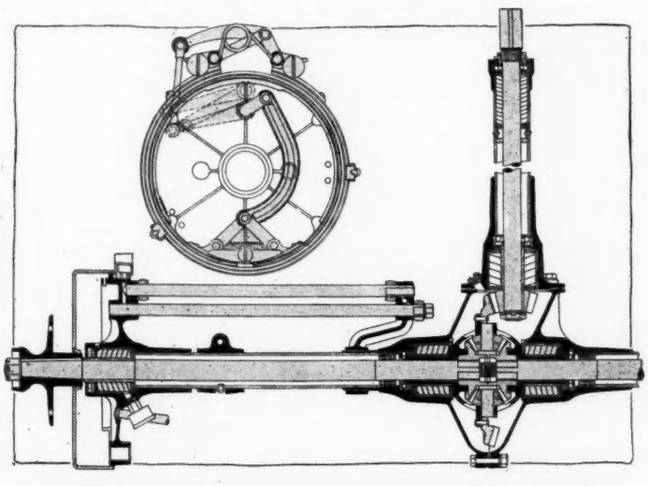


Assembly of clutch and gearset with universal joint

**Gusset Plates Integral**

The frame has been widened at the rear so as to better support the body and to give more battery space under the hood. An entirely new feature in frame design has been adopted in making gusset plates integral with the side rails, reducing the number of parts and adding to the strength.

Lamps are of the same design as previously used. However, a new style of bracket has been adopted permitting of making permanent soldered connections, while at the same time the lamps are adjustable. A dimming switch is provided for the front lamps.



Sectional view through rear axle. View of brake assembly

# The Engineering Digest

## Methods for Brake-Testing the Power of Motors Without Dismounting Them from Car or Boat

### SUGGESTING AN EQUIPMENT FOR REPAIR SHOPS

OCCASIONS frequently arise when it is desirable to ascertain the exact horsepower of a motor in an automobile or boat without going to the trouble and expense of dismounting the motor and placing it on a regular brake test stand. To diagnose shortcomings or make sure of the effects of a repair and for almost all experiments with carbureters and ignition devices, a convenient method for telling the power developed under each of the experimental conditions, while also keeping tests on the road available, is in reality indispensable, but the testing is usually foregone for lack of facilities or for lack of confidence in makeshift arrangements, and the repairs or the experimental results are permitted to end in something less than certainty as to what has been accomplished.

Th. Lehmbeck, authorized automobile engineer of Berlin-Friedenau, Germany, writes of the methods which he has found useful in such cases; substantially as follows:

The motor in a car is usually mounted so closely that the flywheel almost touches the drip pan, and in boats the distance from the flooring is also as a rule very small. It is therefore nearly always a bandbrake which must be used, and while it is not ordinarily recommendable to brake on the flywheel, an exception can very well be made for tests of mounted motors if the proper precautions are taken and the tests do not last more than an hour.

Even in some of the best automobile factories in conservative England the cable brake is still freely used for power determinations, and the method employed there suggests the simplest manner of proceeding, but it can of course only be used if there is clearance enough for the cable. The arrangement, as used in a factory, consists of a cast-iron stand with two bearings, mounted in these bearings a shaft with a broad belt sheave with side flanges, a rope about 30 millimeters in diameter wound upon the sheave with the two free ends reaching upward and attached to two spring scales. The shaft is connected by a clutch with the motorshaft, the motor is started and when it has been warmed up the spring scale on the side where the sheave pulls downward is tightened. The motor then draws the rope around till it begins to rub on the drum on that side while the other end of the rope loosens. The other spring scale is now tightened till it shows a few kilograms of load, by which action the load of the first scale will be increased consderably. After a few minutes a condition of equilibrim is reached, which can be recognized by a reduction of the motor speed taking place when the second scale is tightened further. By now deducting the load of the second scale from that of the first, there is obtained the real load under which the motor has been running. The motor speed being registered by means of a revolution-counter, the horsepower is now figured from the formula: HP. = P N L × 0.001396, in which P is the effective load, N the number of revolutions and L the effective lever arm with which the load is working, or one half of the distance from center to center of the rope strands.

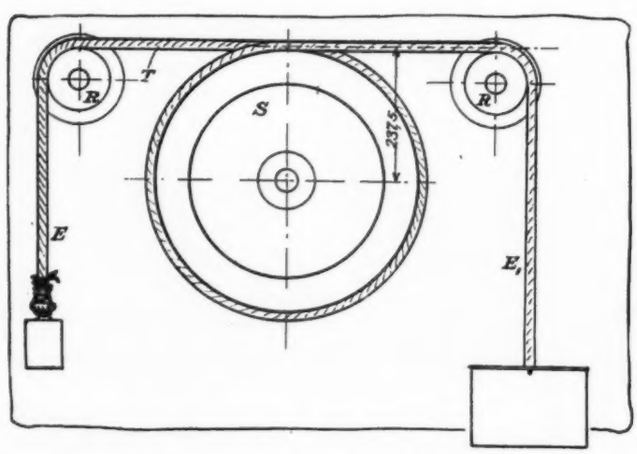



Fig. 1—Arrangement for testing by cable brake

#### The Makeshift Plan

In applying this method to mounted motors, the modifications indicated in Fig. 1 are introduced. The rope T is laid around the flywheel S and the free ends are led right and left over the two rollers R. Assuming that the flywheel turns in the anti-clockwise direction, customary in the case of automobile motors, a weight of 3 kilograms, for example, is attached to the end E, and at the other end E, there is hung a scale for the reception of the loads. Supposing the weight at this end is 12 kilograms, the effective brake load will thus be 9 kilograms. To prevent the rope from slipping from the flywheel, guide boards must be secured at both sides without touching it, and the friction in the journals of rollers R must of course be a minimum. Assuming the diameter of the flywheel is 450 millimeters and that of the rope 25 millimeters, the effective radius of the load becomes 237.5 millimeters, or, when expressed in meters, as required for use in the above-mentioned formula, 0.2375 meter.

The supposed data, with 1,150 revolutions registered by the counter, would give HP. = 9 × 1.150 × 0.2375 × 0.001396 = 3 43.

Motors of up to 25 horsepowers can be tested in this simple manner without fear of burning the rope if from time to time a little soapwater is sprinkled upon the rope or the flywheel.

If there is not room for laying a rope around the flywheel, a bandbrake can be used on the plan shown in Fig. 2. To the two iron brake shoes A and B there is secured a leather belt of the width of the flywheel rim, and a strap of steel skelp, of the same width and 1 millimeter thick, is laid around the belt and made fast to the brake shoes as at 1 and 2. At its middle lower portion this strap is riveted to the leather belt, with the very flat rivet heads counter sunk in the leather so as not to project. Side guards of U shape, 40 millimeters broad and 3 millimeters thick, are also secured to the steel straps as shown in Fig. 2 at 3, 4 and 5.

The flywheel is here supposed to be 400 millimeter in diammeter. To the upper end of the brake shoe A there is hinged the suitably shaped end of a ⅝-inch screwbolt which is about 200 millimeters long and is passed through an oval hole in brake shoe B. A spring washer, a valve spring of 100 milli-

meters length, 35 millimeters diameter and 3.5 millimeters wide, another spring washer and, finally, a handwheel H are mounted as shown, the handwheel being threaded upon the bolt, of course, and this leaves a free, smooth end of the bolt about 50 millimeters long with a hole for the attachment of a wire cable or the hook of a spring scale. In the case of a wire cable, which may be 3 to 4 millimeters strong, it is carried over a pulley and attached, as before, to a scale for the reception of weights.

The brake is first mounted loosely around the flywheel with the brakeshoes A and B about 50 millimeters apart, and the motor is run warm. A rope L is laid around B, as shown, and attached at the other end to something fixed, to prevent the brake from being carried around with the flywheel if it should happen to seize. When all is ready, the handwheel H is cautiously turned on till equilibrium is brought about, as before, the spring at the handwheel serving only to regulate the brake action. Oil is dropped on the flywheel occasionally during the progress of the test, so that the belt shall not burn on to it.

A belt of 5 millimeters thickness lasts at least for one test and cannot break during the test on account of the protecting steel strap.

For convenience in calculations the distance from center of flywheel to center axis of the screwbolt should be made 358.1 millimeters, as this simplifies the formula $HP = P\ N\ L \times 0.001396$ to $HP. = P\ N \times 0.002$.

The figuring can in this manner be done mentally. For example, the motor makes 1,300 turns per minute with a brake load of 22 kilograms, and this gives a power of $11 \times 1.3 = 14.3$ horsepowers.

When a bandbrake is used, the lever arm cannot be made longer than the 358.1 millimeters referred to, unless one can work with a securely fixed rigging, but the arrangement suffices for most cases and gives results which are accurate enough in practice.

It goes almost without saying that for tests of a motor in a car the vehicle clutch should be out of action.

With regard to tests of motors in boats it need only be said that they should be made with the boat in the water, as the air and carbureter conditions here differ from those obtained in a closed room. Also, any test should be made once with the propeller shaft disengaged and again with this shaft turning in its bearings, as the water pressure upon the structure of the boat may affect the friction in this element very considerably.—From *Auto-Technik*, May 23.

## Pointer from British Practice on the Chances for Disk Wheels

VAUXHALL Motors, Ltd., a British manufacturing firm, points out that the recently introduced aluminum disks appear to have increased the popularity of wire wheels, especially among drivers who have so far been unfriendly to them on account of the difficulty of cleaning. The disks are conical, to cover and inclose the whole axle end, and light is reflected from them along two radial lines, with the slant of the cone in them, producing an effect more pleasing than any which can be obtained from flat disk wheels. If it is a true fact, as stated, that objections to the disk type of wheel can be so easily overcome, so far as appearances are concerned, as to make it advisable to transform a wire wheel into a disk wheel by means of a conical aluminum cover plate, those who hesitate to employ steel disk wheels for trucks and other commercial vehicles merely because they are afraid of popular objections to the type may now find encouragement for developing the steel disk wheel to what it should be in the matters of strength, light weight, sightliness and freedom from resonance or other noise. In the French war trucks equipped with this class of wheels no objections have been publicly

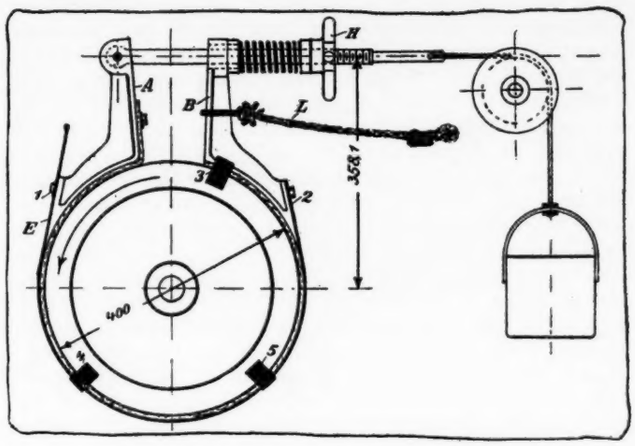



Fig. 2—Band brake test for mounted motor

recorded with regard to their reliability, though in these cases they are equipped with solid rubber tires, but it is not to be denied as yet that the air tires—which of course are the only kind used in connection with the Rudge-Whitworth wire wheels with aluminum disks for pleasure cars—obviate resonance and noise much better than solid tires could do, and, by the same token, protect rivets against working loose. The conical form should have a certain influence to reduce noises, as well, but a relatively soft cushioned seating for a solid rubber tire, such as is already used in some delivery wagons and trucks, would perhaps be the most effective expedient to adopt in this respect, where heavy commercial vehicles are concerned.

## Malleable Nickel Coating for Aluminum by the Canac Process

THE difficulties experienced in providing aluminum with an adherent coat of nickel are well known. Usually, when it is desired to make the deposit by the electrolytic process, an intermediary metallic coating is required, and copper, zinc or iron is generally the metal first precipitated. Naturally the pickling of the aluminum which must precede the process plays an important part but despite all care taken in this operation the nickel coating produced is far from presenting the guarantees of permanent adhesion which would be desirable.

Among methods recently developed, however, one devised by J. Canac circumvents the need of a first coating with another metal and results in a nickel coating so firmly adherent that aluminum sheets provided with such a coating have been placed in the market under the name of aluminum-nickel, although there is no question of an alloy. And these sheets can be used as a raw material to be worked into new forms and articles.

The preliminary pickling of the aluminum is elaborate, however, and comprises the following operations:

(1) Immersion in a boiling bath of potash, (2) brushing with milk of lime, (3) dipping for a few minutes in a 2 per cent. solution of cyanide of potash, (4) exposure to the action of a bath composed of 500 grams of hydrochloric acid, 500 grams of water and 1 gram of iron, until the aluminum takes on the appearance of damascened metal.

After each operation the aluminum is washed in water.

With regard to the composition of the nickeling bath, the following ingredients give good results: Water 1,000 cubic centimeters, chloride of nickel 50 grams, boric acid 20 grams.

The aluminum-nickel will bear hammering; the sheets can be curved or spun without cracking and it is only by fracture that the aluminum can become exposed. It can be heated

up to the fusion point of aluminum without deformation.

In *Revue de Métallurgie* for June Mr. Tasilly examines the nature of the adhesion between the two metals caused by the Canac process. He finds that a light deposit of iron is formed upon the aluminum sheet when it comes out of the iron-containing bath, and it seems that this iron by forming a network on the surface of the aluminum sets up a multitude of terminals which favor the attack by the hydrochloric acid at certain points. The result is a peculiar appearance of the aluminum surface involving a new capacity for holding the electrolytic deposits.

The nickel which is deposited under these conditions takes root, so to say, in the aluminum and forms one body with it so perfectly that it is impossible to detach the nickel without tearing off at the same time particles of aluminum. The metal so treated does not change in moist air, resists chemical actions very well, is nowise affected by wine or alcohol and does not sweat gasoline or kerosene contained in a vessel made of it.

Aluminum-nickel made by this process can thus be employed in all cases where there is use for a light, resistant and unchangeable metal; as for railway appliances, canoes, automobiles, aeroplanes, physical instruments, photographic apparatus, household and travelling utensils.—From *Génie Civil*, September 12.

## New Light Built-Up Steel Wheel Received with Acclaim

A STEEL wheel, built along the lines of present artillery wooden wheels, has been invented by W. Starley, an Englishman, and its manufacture has been taken up by The Jointless Rim Co., Ltd., Birmingham, Eng.

*The Autocar*, which hails this new wheel as something of great importance to motordom, states that "the essential difference between the new wheel and other steel wheels is that it is built up with separate hollow spokes, which are attached to an ordinary steel tire rim at their outward extremity and wedged together at the nave as in a wooden artillery wheel.

"The ten spokes have a U-section and are pressed from flat steel plates, the rounded portions of the spokes being on the outside. The open or inner side of each spoke has a flat plate, welded to it, completely closing it, the welding being done by the oxy-acetylene process. The nave end of the spoke is tapered just like a wooden spoke. When the ten spokes are assembled, the taper leaves a slight space between adjacent spokes, the opening being the widest toward the center. These taper spaces are, in the process of assembling, filled with steel wedges. The outer ends of the spokes fit over small lugs, which are let into the tire rim from the under side and afterwards riveted over. No welding or brazing is required at the rim, as the hollow spokes fit over the lugs and remain firm.

"When the wheel has been roughly assembled, the tire rim is placed in a large vise which grips it at three points, which the wedges already referred to are driven into. This produces a tendency in the spokes to spread, but, being prevented from doing so by the rim, and interlocking with one another at the nave, the wedging action results in the spokes becoming firmly locked together. After the spokes are wedged the center is bored out to a circle, and inside a groove is turned into which is spun a steel liner. This, in turn, is bushed with brass, to prevent rusting.

"A steel flange is fitted on each side, being held in place by spinning over the ends of the steel and brass liners. The lateral strength of the wheel, does not, however, depend on these flanges, which are only fitted to give the wheel a finished appearance. The outer flange is fitted with a brass hub cap so that car makers are not even called upon to provide this; they have nothing to do except to fit the wheels to their hub-shells.

"The methods of attachment is that known as the stud system, each alternate spoke being drilled for the studs or bolts and a cross liner of brass fitted into each hole to prevent rusting and to act as a driving support for the stud.

"Before assembling and after completion the wheel is treated by the Fermangan anti-rusting process inside and out. The total saving in weight in a set of five 26 by 3-inch wheels is about 13 pounds.

"This wheel would seem to not only have the stability and strength of the wooden artillery wheel, but the heat radiating, and resilient qualities of the wire wheel." On the other side it is not to be forgotten that a very high factor of safety is required in a wheel depending for its strength on oxy-acetylene welding of small steel parts and on wedge action of other steel parts, both these elements calling for highly skilled workmanship to secure uniform results.

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# Sensible Methods of Suppressing Reckless Driving

IN the early summer numerous automobile accidents occurred on the Boston Post Road within the town of Greenwich, some of which resulted fatally. As this part of the road extends from the city of Stamford to the New York State line, a number of drivers would "open up" their cars, feeling that they could cross into New York State before being caught. Saturday and Sunday evenings when the tourists were returning to New York and New Jersey were the times when the most flagrant cases of speeding were observed.

The authorities of the town of Greenwich decided to put a stop to this reckless driving and put the matter in the hands of four constables headed by Alden McMurtry of Sound Beach, Conn., a prominent member of the Society of Automobile Engineers. Various traps were measured and a system of signals was arranged for timing.

The state law provides that any speed greater than 25 miles per hour shall be *prima facie* evidence of recklessness. However, if the driver could prove to the satisfaction of the court that at the time of arrest his car was under absolute control, that the highway was clear and that there were no intersecting roads or dangerous turns, it would be doubtful if the charge against him could be sustained, as *prima facie* evidence merely places the burden of disproof on the accused.

A form of schedule was agreed upon after making a number of tests with a large five-passenger touring car, as follows:

Trap A. Speed limit, 35 miles per hour. With muffler cut-out open (unlawful), 30 miles per hour. Passing car going in same direction with car approaching in opposite direction, 30 miles per hour. With cut-out open, 25 miles per hour.

Trap B, located on turn. Limit, 25 miles per hour; cut-out open, 22 miles per hour. Driving turn on wrong side of road although clear, 20 miles per hour.

While an absolute schedule was established, nevertheless a great amount of discretion was used. In the majority of cases a gentlemanly warning regarding the consideration of other users of the highway, etc., had more effect than a troublesome arrest and fine. However, the speed-mad drivers were given no consideration, and heavy fines were imposed. This form of crusade against recklessness has resulted in less than twenty-five arrests during the period from May 17 to September 1. The considerate drivers may run along at 30 miles per hour, provided they use discretion on certain parts of the highway and in congested sections.

# Bank Accounts of Ford Employees Gain 30% in 6½ Months

## Records of the Company Show That Individual Efficiency of Employees Is Increased, While Living Conditions and Health are Greatly Improved by Operation of the Profit Sharing Plan Adopted Last January

DETROIT, MICH., Oct. 2—The working out of the Ford profit-sharing plan was the subject of a talk by John R. Lee in charge of the sociological work of the Ford company recently in this city. Mr. Lee analyzed every phase of the system, showing how the Ford company has taken up every department of the work and how each workman is individually investigated in order to make certain that he is eligible for participation in the plan. Mr. Lee showed that within the first month 60 per cent. of the workmen were participating, this notwithstanding the fact that the working force of the company approximated 20,000 and represented forty-nine different nationalities.

In order to facilitate the work of investigating the different employees it was necessary to start a school in which the English language was taught, there being upwards of 1,000 enrolled in this at the present time.

The economics of the profit-sharing scheme was proven by the fact that after it had been in operation for 7 weeks it was possible to build more cars with fewer men and working fewer hours per day.

### Men's Health Improved

As to how the profit-sharing plan is actually working out for the benefit of the worker, the report shows that after 6 1-2 months' work the bank accounts of the employees had increased 30 per cent. Of still greater importance was the fact that punctuality and regularity had increased to a remarkable extent and the general health of the employees was improved.

Mr. Lee said in part:

"The Ford Motor Co. was first incorporated under the laws of the State of Michigan, January 16, 1903. It was originally capitalized at $100,000, which was subsequently increased by a stock dividend of a very large surplus to $2,000,000. The company started its incorporation with $28,000 in cash, and this has taken care of the corporation since it started, that is to say, nothing outside of this $28,000 was ever taken by the company in the way of money.

"The plant in Detroit, together with its various branches in different parts of the world, covers approximately 150 acres, and represents some 7,000,000 square feet of floor-space.

"For the year ending October 31, 1913, the gross business was $90,000,000, or it represented 165,000 cars, and the profit thereon was in the neighborhood of $20,000,000.

"From September 30, 1913, to the present time, the gross sales have been $110,000,000, representing 226,000 cars, and the rate of earnings the same, showing an increase over preceding periods, notwithstanding the fact that the price of the finished product has been materially lessened and our profit-sharing plan has been in operation since January, 1914.

### Forty-Nine Varieties Work

"The working force of the company is about 20,000 altogether, and at present represents forty-nine different nations or countries of the earth. I give you these facts, and the following names of countries our men represent, in order that you may a little better understand our problem.

"The men we have working for us represent the following nationalities: American, Polish, Hungarian, Italian, Spanish, English, Irish, Welsh, Scotch, Russian, Greek, Turk, Bulgarian, Dutch, Belgian, Swiss, Norwegian, Swede, Dane, Finnish, Japanese, Chinese, Australian, Macedonian, Persian, Negroes, Indians, Canadian, French, German, Servian, Austrian, Mexican, all the South American countries and Central America, forty-nine in all.

### An 8-Hour Day

Sixty per cent. of our employees speak English and 33 per cent. are citizens of the United States. The ages of our employees are from 16 to 75. We are operating a so-called open shop. Our work is all done on per diem basis, that is to say, at an hourly rate. We have no piece work, or bonus system. We work 8 hours out of the 24. We have some departments requiring two shifts, some three.

"Our profit-sharing plan differs from all the other profit-sharing plans of which we have any knowledge in all its features. Let me state here that it was not inaugurated or planned, or put into operation, as a business expedient in any way whatsoever.

The aim of the Ford Motor Co. in arranging for the gigantic step was to better the financial and moral condition of each employee and those dependent upon them.

"The money that is paid employees under the profit-sharing plan comes to them regularly in their pay envelope, to be used, and by use thereof they are acquiring American ways, methods of business, strength of manhood, loyalty, and improvement in their conduct of self as citizens of the United States.

"There is no stipulation or proviso, whatever, in the plan which deprives an employee of anything given him under it, should he see fit to sever his connections fairly and honorably with the company at any time. It is required, and is the object of this plan, that the employee shall use the money given him as his part of the profits in ways which will not harm or be a detriment to himself, or to society at large.

"There are three groups of eligibles:

"First: All married men, living with and caring well for their families.

"Second: All single men past 22 of good habits.

"Third: All women or single men under 22 years, living with and sole support of some next of kin.

### The Sharing of Profits

"The statement ordinarily made that the minimum wage is $5 a day is not correct. We pay for 8 hours' work approximately 5 per cent. more than they would receive at any other shop for 10 hours. Then they add to that enough to make up the $5. Those men in the factory who are getting up to and including 38 cents an hour come under the $5 class. Those getting from 38 cents and up to and including 48 cents, receive $6 per day; those receiving 48 cents an hour or over, receive $7 a day.

"On this basis, for example, if a man's wages amount to $2.75, add to that $2.25 as his share of the profits, which is paid

## Classification of Employees Wage Schedule Made Effective October 1, 1913

Key

A—Mechanics and Sub-Foremen
B—Skilled Operators
C—Operators
D—Helpers
E—Laborers

Service—Employees in Service Continuously for Two Years and Over
1—First Class Workmen
2—Men of Average Ability
3—Beginners

| Skill Rate | Former Hiring Rate | Present per Hour Rate | Rates Ranging | 59-60 | 52-58 | 46-50 | 42-45 | 38-41 | 34-37 | 29-33 | 26-28 | 23-25 | 20-22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Condensed To | 65 | 60 | 54 | 48 | 43 | 38 | 34 | 30 | 26 | 23 |
| A—X X | | | | 2 | 7 | | | | | | | | |
| A—X | | | | | | | | | | | | | |
| A—1 | | 54 | | | | 2 | | | | | | | |
| A—2 | | 48 | | | | | 45 | | | | | | |
| A—3 | | 43 | | | | | | 273 | | | | | |
| B—Service | | 43 | | | | | | 51 | | | | | |
| B—1 | | 38 | | | | | | | 606 | | | | |
| B—2 | | 34 | | | | | | | | 1457 | | | |
| B—3 | 23 | 30 | | | | | | | | | 1317 | | |
| C—Service | | 38 | | | | | | | 19 | | | | |
| C—1 | | 34 | | | | | | | | 348 | | | |
| C—2 | | 30 | | | | | | | | | 2071 | | |
| C—3 | 23 | 26 | | | | | | | | | | 4311 | |
| D—1 | | 34 | | | | | | | | 31 | | | |
| D—2 | | 30 | | | | | | | | | 137 | | |
| D—3 | 23 | 26 | | | | | | | | | | 416 | |
| E | 23 | 26 | | | | | | | | | | 2003 | |
| Special | 20 | 23 | | | | | | | | | | | 208 |
| | Compiled August 4, 1913 | | | | | | | | | | Total | | 13,304 |

to him on his regular pay day in cash.

"We make a sharp distinction between amount of wages and profits, in order that the benefits of the plan may be safely, sanely, and positively appreciated in each individual case.

### Profits Sometimes Withheld

In the operation of the plan, we are finding many cases where it is necessary for the general good to withhold profits from some of the men, and in many cases to take away from them all of the profits already granted until they can fully realize the advantage of same.

"In order that the facts above stated can be fully understood, would say that up to date we have recovered the sum of $7,000 paid employes who obtained their profits under false conditions, or were using them in some way detrimental to themselves and others.

"The true foundation of this plan was conceived a little prior to January, 1914.

"The Ford company began to recognize the human element in the three-fold phase of manufacturing, men, material and money.

"We are working today instead of 9 hours a day, 50 hours a week, and have increased the wages 15 per cent.

"We have a systematized rating according to skill or ability, and indemnify each employe against petty discrimination by the foreman, and have arranged a clear cut simplified scale of wages.

"When a man fails to get along in one department, he is sent to our employment department, and there questioned closely to make sure of the fact that he is not undesirable and an unworthy individual. At this place, he is given another trial in some other part of the factory.

### Investigating the Worker

"Each employe has been at some time investigated, at the time of employment or some time subsequently, and a record taken as to his financial condition, his place and method of living, his occupation, those dependent upon him, kind of recreation indulged in, his habits, age, religion, home conditions, neighborhood, ambitions, what he intends to make of himself, if anything. These data are gotten by men from all sources, from himself, his wife, his pastor, church records, etc.

### Teaching English Language

"The working out of all this has presented very many problems. The fact that so large a percentage of the men have no knowledge of the English language made it necessary for the company to establish a school for enlightening them. We have now enrolled about 1,000 men, who are being taught English by the Roberts system, teach him the ways of American citizens, even to purchasing and handling of property, etc.

"To gather information from employes, we organized first a band of about 200 men. We have sifted this band of men now down to twenty men, and after examination all stand high in gentlemanly qualities, tact and diplomacy, human interest, conception of the profit-sharing plan.

"Each man is kindly and thoroughly brought to see, if possible, the benefits of better manhood and better standard of living, if he be unable to appreciate them for himself. We try to teach them self-respect and care for home and children.

### Many Interesting Cases

"We have found many interesting cases since beginning in this work, and I will tell one of them here. A great big chap weighing 250 pounds walked into the office one day. I asked him what he wanted. He said, 'I am so and so, and I want to know why I don't get $6 a day.' We sent for his time sheet, and found he was one of our foremen. We asked him a few questions. He said he thought he had a mother, but he didn't know where she was; there was no one dependent upon him. We asked him if it wasn't true that he paid his board 2 weeks in advance, put the rest of his change in his pocket, and just let it seep out, etc. 'Well,' he said, 'what of it, what ought I to do with it?' 'Well,' I said, 'You have got to prove to us that you have some of the elements of thrift before we give you this money.' He said, 'What have I got to do? I don't know how to start.'

"We suggested that he look up his mother, etc., and that he had to be thrifty.

"He got to the door and turned around. He says, 'I was a bum once and I may as well be again—you don't appreciate me around here.'

"We found he was a very responsible employe, and told him to go out and see if he couldn't find himself. He came back in 6 weeks, and handed me a letter from his mother full of gratitude and delight to think that he had come to her again, and acknowledging receipt of $25. She said she never had anything do her so much good, said she didn't know whether he was dead or alive, and was so glad to hear from him, particularly as she needed the $25, as she had been living around among her friends without any money. He showed me a receipt from a tailor, showing that he had paid $8 on a bill about 8 years old; then a receipt from some lodge he belonged to, and last of all, he showed me a bank book with $40 in it.

"We immediately approved him for his share of the profits, and it is the most gratifying thing in the world to see him living here in Detroit with his mother, with his bank account growing every day, and a man altogether satisfactory to us in the shop, improving in his work, and he now wants to be enrolled as an instructor in English in our school, and we are going to enroll him.

**60 Per Cent. in First Month**

"The figures showed after the first investigation taken about Feb. 1, 60 per cent. of the men were receiving profits, because they seemed from the records to embody the necessary qualities to receive and use the money under the plan according to the purposes of it.

"We have just completed Sept. 1 investigation, and this percentage has grown from 60 per cent. to 82 1-2 per cent. of the total force. The other 17 1-2 per cent. represents the ineligibles, or men whom we are still working upon, but up to the present time are not qualified to receive the money.

**Fewer Men, More Cars**

"In the month of February, 1913, with 16,000 men working 10 hours a day, we built and shipped 16,000 cars. In the succeeding February, after the profit-sharing plan had been in operation 7 weeks, with 200 men less, working 2 hours a day less, we built and shipped 26,000 automobiles. It is true that the giving of a portion of the profits to each individual qualified is not entirely responsible for this tremendous increase. Much is attributed to improved methods. Of the 44 per cent. increase, 25 per cent. is the proper amount to credit to the men.

**Bank Accounts Up 30 Per Cent.**

"On August 1, or about 6 1-2 months after the plan was inaugurated, a gain is shown in the bank accounts of our employees of 30 per cent.; in the amount of life insurance, 86 per cent.; homes bought and paid for, 87 per cent.; lots bought and paid for, 86 per cent.; homes bought on contract, 75 per cent.; lots bought on contract, 135 per cent.; and payments made on contracts for lots, 145 per cent.; amount of rent per month, 12 per cent.; amount of board per month, 11 per cent.

"These last two figures are interesting, inasmuch as they show that the men have moved out of squalid quarters into neighborhoods where conditions were better.

"We have a directory, somewhat on the plan of our city directory, and have made a map, showing districts inhabited by our employes. Each section is marked according to the character of the residents.

"Punctuality and regularity of attendance is present to a surprising degree, and this has solved many, many problems that were more or less vexatious in our various departments. Spoiled work has greatly decreased, and our medical department tells us that our men, as a whole, have gained in health since January.

"It is perfectly natural for men to wonder about the permanency of this plan, and we can only say concerning it that it is the outcome of a business which for 11 years has been built by perseverance and with all the conservative judgment that the human mind is capable of. The Ford company has laid plans so that the profit-sharing plans, or rather toward men-making plans, shall endure, and also plans have been started which will bring about a still better condition for these men, firmly convinced of the wisdom of the saying, 'Whatsoever a man soweth, so shall he reap.'

**Study Men in Factory**

"We watch the individual man in the shop just as much as we watch the product and each individual machine; in fact, we watch our men three times as much as anything else.

**Six Grades of Men**

We have six grades. We have also some forty-eight different rates of pay that we apply to different skill throughout the shop, and we boiled them all down to eight. A man starting with us here as a skilled operator in the B class goes in as a B-3 operator at 30 cents. We watch him and as soon as he improves he is placed in the B-2 class. He doesn't have to wait upon the tender mercies of his sub-foreman, but is watched from the time department, to see that he is advanced when he deserves it, and his wages will be raised from 30 to 34 cents.

"The table herewith represents a survey of 13,304 men, not quite all of the force here at this time. The majority of the men fall into the C and B groups, these are machine shop operators and average men throughout shop. These groups, A, B, C, are producers, D are helpers, plumbers, steamfitters, etc., E is the common laborer. We pay the laborer, unproductive, one rate. We have a special grade for messengers and some women in our employ. This whole scheme has given splendid results.

**Investigate Each Man**

"We take his name, his residence, married or single, speaks English or not, religion, recreation indulged in, birthday, lived in Detroit, how long, number of children, names and ages of children, names of persons dependent, how much they earn a week, number at school. This information we do not use at all in the consideration of the fitness of the man, but you can imagine that in going among all this foreign element to get the truth, we had to have something or other to throw light on the man, to be sure that the data he gave us about his family and people dependent upon him was right. For instance, we ask a man if he is a Catholic, and what church he goes to. We go and consult the priest. We find many who say they are married are liars.

**How Banking Grows**

"The Ford company has been charged with influencing its employes to deposit their savings in Highland Park State Bank, stock of which is owned largely by members of the company. Only 28 per cent. of the savings of employes since the profit-sharing plan was inaugurated were shown as having been deposited in Highland Park State Bank. The other 72 per cent. were in other banks throughout the city.

"Bank deposits have increased 80 per cent. since the profit-sharing plan was started. Of the American employes, 609 have no accounts, 2,280 have bank accounts, aggregating $462,411, an average of $202.81.

"The Irish come in pretty strong, with an average of $291; the French and Hollanders with $304, and the prize deposit is held by a Hindu and is $575.

"Out of 2,889 Americans, 1,631 have life insurance. Several nationalities, Greek included, do not believe in life insurance, as not one man out of whole numbers of those nationalities employed carries any insurance.

**Making Citizens**

"Bank accounts were shown by religions. Out of 9,501 men 6,175 speak English, 3,076 do not and 3,640 out of this number are naturalized citizens. We are trying to prepare thirty men weekly for citizenship.

"The Americans predominate in owning homes and lots, although they do not always predominate in average value, as we look through the columns of our investigation records.

"The percentage of good homes at the first investigation was 47, and on the second, 69 1-2. The fair homes at first were 39 per cent. and on the second investigation, 29 1-2 per cent. Poor homes at first showed 23 per cent., but on the second investigation had declined to 1 1-2 per cent.

"Neighborhood conditions have improved from 41 to 57 per cent., the fair jumping from 40 to 40 1-2 per cent., while the bad declined from 19 to 2 1-2 per cent.

**Ford Motor Co. Employees**

| | Dec., 1912 | Oct., 1913 |
|---|---|---|
| Five-day men | 3,594 | 322 |
| Men discharged | 776 | 137 |
| Men quitting | 386 | 326 |
| Men laid off | 4,822 | 844 |
| Total hired | 5,678 | 1,789 |
| Gain for month | 856 | 945 |

The Automobile

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# Our Opportunity

BEING prepared when the opportunity comes is a great secret of success. In business the young man, filling satisfactorily his $25-per-week job, will only be assured of the job higher up, if when the vacancy occurs he has prepared himself and is equipped and ready for the higher duties. In proportion as he has prepared himself for such will his efforts meet with the highest success.

So in our industrial worlds, conquests were never made by looking around, whining and wringing the hands. This is a world of activity, one in which "art is long and time is fleeting." A world in which favorable business conditions are not made specially for the individual concern, but in which the condition is open to all and only those profit who are ready when the opportunity comes.

### The Opportunity

Such a business opportunity has presented itself to the American motor truck industry. Foreign powers are buying trucks and the demand came in the twinkling of an eye. There was no herald 6 months ago announcing from New York to Chicago that in September and October Europe would buy trucks in quantities that would keep many factories working on night-and-day forces, rather the chapter of opportunity was penned in a single week, and the final decision arrived at in one short day. Yesterday there was scarcely a symptom of need for American trucks in Europe, yet today the demand is here.

A few concerns are going to profit well by this opportunity, they are going to profit because they are ready for the opportunity. During the past months they have been cutting their cloth to meet requirements, doing business by going out in the highways and compelling it to come in; whereas others have talked depression, have looked on the great expense of American industry through the wrong end of the telescope and have allowed themselves to feed their own discontent. Such firms are today in a poor condition to meet the opportunity, which it is not necessary to cross the Atlantic to get in touch with but which has come to our very doors.

### As Others See Us

Europe has examined our motor trucks during the past 3 weeks, and is today telling us our shortcomings as seen in the light of their experience. With Europe our trucks are too heavy, fully 20 per cent. heavier than those of France, Germany or England. This added weight is a direct handicap. We are today, and have been for 2 or 3 years, working for lighter-weight passenger cars, cars in which a great percentage of the motor power is not consumed in transporting the needless excess weight of the vehicle. We have acknowledged this situation, and have begun an era of higher efficiency in motors and the chassis in general.

### The Springs

Spring suspension plays a much greater part in truck life than it is generally given credit for. Europe views spring suspension as a most important factor. If the spring system is not correct, you wear your tires too rapidly. The road wheels must hold the road. They must not bounce off the surface. Every time they bounce off the surface, the wheel spins or lags and there is tire wear. Hence, spring suspension becomes a vital factor in reducing tire wear, which is one of the most considerable factors in the expense of truck upkeep.

### Wear

Ability to wear is the criterion that many foreigners use in the selection of a motor truck. Will it wear? This is the question they endeavor to solve. Parts must wear, and have they provision for adjustment? Can you adjust the bushings of the steering gear when they wear? It is cheaper to adjust than to replace. It is much quicker and in either war or industry the economy of time is a vital factor in truck operation.

So adjustment and accessibility become real factors in truck work. So Europe considers it, and as Europe is the big buyer today, it is quite necessary that these matters be conspicuous. But adjustability and accessibility are not important solely because Europe thinks so. Our own conditions demand them. Our industries demand such; and should our nation make large purchases of trucks for war purposes or determine on some form of truck subsidy system these factors would be equally important.

# Horsepower and Gasoline War Tax Defeated by Senate Caucus

## After Repeated Amendments to the Original House Measure Had Been Killed, Both Provisions Were Voted Down in Stormy Midnight Session—Victory May Be Only Temporary

WASHINGTON, D. C., Oct. 7—There will be no American war tax on automobiles and gasoline. At least, the provisions of the House of Representatives that would have collected 1 cent from the sale of each gallon of gasoline and 50 cents per horsepower for every automobile sold, were defeated late last night in a Democratic Senate caucus.

**Long Fight Is Expected**

It is expected that, in spite of the automobile and gasoline taxes having been thrown out by the Democratic Caucus, the House of Representatives will try to put them back on the bill. A long fight on the war revenue measure is expected to prolong the session of Congress. It is expected that the increased tax on beer, and 5 cents a gallon on rectified spirits will offset the loss on automobile and gasoline taxes.

The vigorous resistance of the automobile industry to the measures, in which it was shown that a necessity and not a luxury would be made to suffer heavily by the two taxes, probably influenced the senators and representatives.

The session was a tempestuous one and the discussion of the automobile tax caused the greatest trouble.

The vote of the caucus was 20 to 17 against the 1 cent per gallon tax on gasoline, the Senate committee having reduced the House assessment of 2 cents a gallon.

Among other changes in the original bill are:

The tax on chewing gum is 4 cents for each dollar box sold.

The committee added a tax on sparkling wines, not otherwise provided for in the bill, of 1 cent on pint bottles and 2 cents for bottles containing more than a pint.

It was decided to exempt from the tax all theatres and entertainments, chatauquas, lectures, lyceums, agricultural and industrial fairs and religious and charitable entertainments.

The committee estimated that several millions of revenue would be derived from the added taxes.

The first action of the caucus was to vote an increase in the proposed extra tax on beer from 50 cents to 75 cents a barrel, to make the total tax $1.75 a barrel, with a drawback of 5 per cent. for purchase of revenue stamps in advance. The amendment, urged by Senator Williams of Mississippi, was carried by a large majority after Senator Stone had made a vigorous speech against it. A special revenue tax on rectifiers of distilled spirits of 5 cents a gallon also was adopted. Together the proposed taxes on liquors would yield an annual revenue of more than $50,000,000.

Democrats of the Finance Committee had agreed to the House tax of $1.50 a barrel on beer, which would yield, at 50 cents over the normal tax, an added revenue of $32,500,000 annually. The further addition of 25 cents a barrel by the Senate Democrats would yield another $16,000,000. With the 5 per cent. discount for prompt payment figured, the least to be derived from beer would be approximately $46,000,000.

The proposed tax of 5 cents a gallon on rectified spirits, Treasury experts estimate, would yield $5,000,000. Thus the total to be derived from liquors would be more than half the anticipated Treasury deficit caused by the European war.

The caucus retained the stamp tax of 2 cents on Pullman car tickets. There will be no stamp tax on checks or other negotiable paper in this bill as approved by the Democratic caucus.

The caucus also revised the tax on banking capital. As framed by the Senate Committee, the bill would have levied $2 for every thousand dollars of banking capital and surplus. This rate was reduced to $1 per thousand by a vote of twenty-six to eleven.

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# Injustice of Bill Strenuously Argued by Industry

WASHINGTON, D. C., Oct. 6—The last draft of the proposed war tax revenue measure, as drafted by the three Southern Senators, places a tax of 1 cent a gallon on gasoline and 50 cents per horsepower on passenger, gasoline cars, this horsepower tax to be paid by the manufacturer or dealer, the tax to be paid by the manufacturer excepting under conditions where he has already contracted for the sale of his cars with his dealers, in which case it is expected that the dealer will have to meet the bill.

Alfred Reeves, general manager of the National Automobile Chamber of Commerce, was in this city today representing his organization, and hoping to make a date for a public hearing on the measure. A public hearing was denied and he was granted a conference with two of the Senate committee, Senator Simmons of North Carolina and Senator Williams of Mississippi. Senator Gore of Oklahoma, the third member of the committee, was not present.

The committee acknowledged to Manager Reeves that more pressure was being brought to bear against the gasoline tax than had been brought against any similar measure in Washington. Practically all automobile manufacturers, all accessory manufacturers, all automobile dealers' assns., and a great many of the large automobile and supply dealers have forwarded telegrams to the committee. Scores of other organizations have forwarded their resolutions and from all sections protests have arrived against the measure.

**Governor of Michigan Protests**

Governor Woodbridge N. Ferris, of Michigan, sent the following telegram today to U. S. Congressman Underwood:

"Proposed motor car tax will in my opinion, strike a deadly blow at Michigan's greatest manufacturing industry. Michigan is loyal and patriotic, and ever willing to bear her share of the nation's burden. This industry is a Godsend to tens of thousands of laborers. Give us a tax that is not centralized—a tax that approximates a uniform distribution for those who have and to spare."

The reduction of the gasoline tax from 2 cents a gallon to 1 cent was brought about largely by the general protests not only from motor car manufacturers, but also from the thousands of farmers using stationary engines and gasoline engines used in power plants and other places. The sentiment is general that the present compromise of 1 cent a gallon on fuel will not be seriously disputed, but the horsepower tax of 50 cents per horsepower will be combated from the start.

What 50 cents per horsepower on gasoline passenger cars means to the automobile industry does not seem to be comprehended by the committee, which considers the gasoline pleasure vehicle solely a luxury and not a business necessity. The committee seems to be unanimous in the belief that there are scores of large automobile concerns making fabulous fortunes each year, and entirely neglects the hundreds of small companies that would practically be forced out of business by the horsepower tax.

Already the automobile dealer is taxed in many different ways, and the additional tax proposed by the Senate Committee would place an unreasonable hardship on many motor interests. For example, a dealer in automobiles in North Carolina, it is reported has at present to pay $500 per year for the privilege of doing business. To this we must add the various registrations that are required. Each state registers the cars and in many states personal property taxes on automobiles are paid; chauffeurs are registered in excess of horse drivers, and several states that have wheel taxes which are particularly burdensome. In the State of Iowa, with its 100,000 automobiles, it is estimated that the gasoline consumption is 75,000,000 gallons annually, which gives a revenue

from this state alone of $750,000. It is not surprising that a general protest from all owners and dealers in vehicles should come from this state as well as others.

### Many Send Objections by Wire

During the course of a speech in the Senate, Senator Smith read telegrams from many manufacturers protesting against the proposed tax. Herewith are presented some of these telegrams:

Nordyke & Marmon: "Proposed tax is the greatest menace to the industry in its history, owing to the contracts existing with dealers. Tax can not be passed on to consumers and will fall as an unjustifiable burden principally upon the states of Michigan and Indiana. Automobile manufacturing is one of the few industries that has kept the spark of industrialism alive in the United States during the long depression the country has been passing through. The automobile manufacturing industry as a whole is in no condition to stand this discriminatory tax."

### Indiana Companies Protest

The Indiana Automobile Manufacturing Assn., the Hoosier Motor Club and affiliated clubs and workmen employed in the automobile factories of Indiana have also protested against the proposed tax on automobiles and on the capital stock of automobile manufacturing companies. Representatives of thirty-two motor car makers sent a telegram to Lincoln Dixon, member of the Ways and Means Committee, urging that he use his influence against such a tax.

Owners of cars and workmen joined the manufacturers in sending telegrams of protest to President Wilson, the Congress and members of the Indiana delegation in Congress. The messages state that practically all the motor cars built in the United States are manufactured in Indiana, Michigan and Ohio, and that hence the tax would be discriminating:

C. W. Nash, president Buick Motor Co.: "Senate committee's recommendation taxing owners and manufacturers of automobiles is the most serious blow that could be dealt this industry. We appeal to you to use all honorable means to save Michigan's greatest industry. Also request hearing of manufacturers before senate committee."

Hupp Motor Car Co.: "This seems to be vicious class legislation. No other industry has been singled out for such drastic and confiscatory action. The automobile must be recognized as a public necessity and convenience instead of a mere luxury. The hundreds of thousands of users of automobiles in the United States are entitled to the same fair and just treatment that should be applied to all other owners of property."

Chalmers Motor Co.: "We have already been forced to make a reduction in the price of our cars, due to conditions existing abroad and a tax of $40 per car would reduce the profit to a point where the successful operation of our company would be seriously impaired."

Studebaker Corporation: "The proposed special tax is intensely disturbing to the entire automobile industry. It immediately threatens the existence of numerous companies and the consequent elimination of income to many thousands of employes. Such an overwhelming blow to the automobile industry at this critical time would positively introduce wide disaster. There are approximately 1,548,350 automobiles owned in the United States, whose owners already pay property and state taxes. The majority of these cars are owned by persons in moderate circumstances and the use of these cars largely for business purposes makes them practically a necessity. The imposition of a third tax on motor cars and automobile owners is a positive burden amounting to discrimination. It is confiscation. The gravity of this proposed step and its far-reaching influences, which, in our opinion, can not have been adequately and thoroughly reviewed, makes a hearing in conference on this subject of vital importance and we respectfully request an early opportunity to lay before you important facts in connection with the proposed plan."

Cadillac Motor Car Co.: "Congress surely does not appreciate what would be the effect upon the entire automobile industry if proposed impost were forced. Michigan, in particular, would suffer a staggering blow. The automobile has become a commercial necessity for the whole country and its manufacture should be encouraged and not crushed. Michigan now depends largely upon the automobile industry for employment and thousands of Michigan workmen would become injured by such an unjust tax."

Federal Motor Truck Co.: "New proposed tax for motor truck manufacturers means suicide. Truck manufacturers in America to date have not made a dollar. Trucks are not a luxury; are sold on cost of installation and operation. Any additional tax will have lead effect on truck industry."

Henry B. Joy, president Packard Motor Car Co.: "Proposed additional tax is unfair and inequitable in the extreme. We now pay in taxes $35 on every vehicle we ship. Proposed tax would increase taxation to $75 each, an impossible, burdensome taxation."

Charles Thaddeus Terry, general counsel National Automobile Chamber of Commerce: "Automobile manufacturers throughout country protest against tax. Automobiles now pay three taxes. More taxes will destroy industry."

Imperial Automobile Co.: "If the proposed tax becomes a law you will ruin every automobile manufacturer in America."

In addition to the above, telegrams of protest have been received by Senator Smith and Senator Townsend from Stutz Motor Car Co., Briscoe Motor Co., Jackson Automobile Co., Abbott Motor Car Co., Anderson Electric Car Co., Briggs Detroiter Co., Commerce Motor Car Co., Cricket Cycle Car Co., Day Automobile Co., Dodge Bros., Ford Motor Co., Hudson Motor Car Co., Krit Motor Car Co., Regal Motor Car Co., Saxon Motor Co., Signal Motor Truck Co., Wagenhals Motor Co., Wahl Motor Co., Republic Motor Truck Co., Cartercar Co., Durant Dort Carriage Co., General Motors Truck Co., Havers Motor Car Co., National Motor Truck Co., Oakland Motor Car Co., Olds Motor Works, Reo Motor Car Co., and Detroit Auto Dealers Association.

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# Armored Cars for U. S. Army, Congressman Urges

WASHINGTON, D. C., Oct. 5—Some time this week Congressman Anthony, of Kansas, member of the House Committee on Military Affairs, will introduce a bill to have the United States army adopt and purchase armored motor cars as a regular arm of the military service. Several other members of the committee on military affairs have kept a close watch on the war efficiency of armored cars as described in the European dispatches and the sentiment at the Capitol is that the present war has demonstrated that this government can no longer afford to be without this equipment.

"To my mind," said Congressman Anthony to THE AUTOMOBILE correspondent, "there can be no doubt that any up-to-date army must be equipped with armored automobiles. The things that have been accomplished through their use by both Germans and the Allies have demonstrated that, as engines of modern warfare, they are indispensable.

"There was a time when people laughed at the idea of the automobile being a business asset, but only one glance at the country roads and wheat fields of my state, Kansas, is necessary to show that mistaken idea. And, since those nations which are recognized as having the most perfect military organizations in the world have demonstrated not only the efficiency but the necessity of armored cars, it seems to me high time for the United States Government to correct a defect which at any time might have the most serious consequences for our army.

"The time may easily come soon when much of the military work done by the horse will be accomplished through the instrumentality of the armored car. When this time does arrive it would be a great mistake to have this country behind all others in such valuable and essential equipment."

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## N. Y. Separator Repeal Law Defeated

NEW YORK, N. Y., Oct. 6—The New York City dealers and garagemen who have been fighting against the gasoline separator, the installation of which is required by an ordinance, were unsuccessful this afternoon in having the repeal of the separator law passed by the Board of Aldermen over the Mayor's veto. The vote was thirty-three to twenty-one in favor of retaining the old ordinance on the books; fifty-three votes, or two-thirds were necessary to override the veto. The board voted to repeal early in the summer.

This, however, does not mark the end of the fight. In pleading with the Board of Aldermen not to override the veto of Mayor Mitchel and repeal the ordinance, the Fire Prevention Bureau stipulated that it was perfecting a satisfactory separator than can be installed for less than $100 and would take no further action until this device was ready for the market; all present devices are declared by the garagemen to be expensive and not satisfactory after installed. As a further move, the appeal may be reattempted or a substitute ordinance may be introduced.

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JACKSON, MICH., Oct. 5—The Argo Motor Co. has been incorporated. Capital stock $750,000. Benjamin Briscoe, president; Jas. R. Findlater, vice-president; F. D. Dornam, secretary; L. E. Latta, treasurer.

# Not More Than 27,000 Cars in America South of U. S.

## European Consignment Methods Described by Hupp Export Representative—Governments Selling Cars "Abandoned" in Customs

DETROIT, MICH., Oct. 5—"In all the countries south of the United States, that is Mexico, Central and South America, there are not over 27,000 automobiles, according to the most recent statistics which I have secured, and of that number about 15,000 are in Brazil and Argentina," said Peter Severin Steenstrup, export representative of the Hupp Motor Car Co. in South America, who is now visiting in Detroit.

"The automobile business in South America has really been overdone, and this is especially true concerning high-priced cars. The business is done mostly on a consignment basis with most of the European automobile manufacturers. Through their banks in the different South American countries they are able to investigate very quickly the financial standing of their agents or of the importers handling motor cars, and thus sometimes grant more than 90 days for the settlement of their accounts.

"However, in many cities the customs are now crowded with high-priced cars which have not been taken out by the consignees. As the storage charges amount to 1 per cent. of the invoice for the first month, 2 per cent. the second month, 4 per cent. the third month, and thus keep on an ascending scale the price to be paid for the cars when the consignee is finally in a position to take them out is generally so high that the cars are left with the customs and thus annually a large number of high-priced automobiles have to be sold by the government, or rather by the customs, and generally the prices obtained are not higher than what a medium-priced new car costs.

### Government Sold Cars

"Last May there were 300 such imported cars in the customs house at Buenos Ayres, Argentine, and I know of two instances where $5,000 cars were offered for $2,000 and it was not at all an easy matter to find purchasers, notwithstanding their real value.

"The majority of automobiles owned in South America are bought by the wealthy city people who are able to afford a chauffeur. The number of owner-drivers is very small, but with the advent of the moderate-priced American cars it is very likely that the number will be increasing more rapidly. The owner-drivers are especially to be found in certain sections of Brazil.

### Farmers Will Buy

"The number of farmers owning automobiles is still relatively small, but during the last 18 months the number has increased and is certain to go on increasing, as the dealers are directing their efforts much more than heretofore to the agricultural sections of the country, such as the provinces in Brazil where coffee is grown.

"The greatest drawback for the more rapid progress of the automobile business in most all of the South American countries is the entire lack of good roads, for outside of the highways and roads near the big cities there are hardly any roadways at all. Even in Africa one will find better highways than in South American countries. As an example of this, I will cite the case of a party of motorists which made a trip from Rio de Janeiro to Sao Paulo, a distance of about 400 miles—about as far as from New York to Buffalo—and it required 13 days to make the trip.

### Argentina Needs Stone Roads

"In Argentina there is now a big movement afoot for having good roads built, as the recent extraordinary season of rain—it rained practically continually during the months of March, April and May—made the highways and roads absolutely impassable. As a consequence 30 per cent. of the corn crop was absolutely lost as it was impossible to haul it to the railroads. This could not have happened if stone or macadam roads had existed.

"Under ordinary weather conditions it requires about 10 hours to drive from Valparaiso to Santiago, in Chili, the distance being some 100 miles, but part of the year, during the rainy season, the roads are impassable and motor car traffic impossible.

"In some of the South American countries the application or the levying of duty by the customs is somewhat of an unpleasant joke, as there is a great difference when the duty is levied in gold or when it is in paper; for instance, in Brazil there is, according to the tariff, a 7 per cent. preferential tariff on American motor cars, but as a matter of fact when it comes down to actually settling the bill the duty amounts to 18 per cent.

"One of the principal reasons why the American manufacturers have always been at a disadvantage in doing business in South America is the lack of American banks in those countries. By being compelled to send their bills of lading and other shipping documents and invoices through the foreign banks in South America, our foreign competitors are naturally able to learn, not only our prices, but also who our customers are. This is a condition which I understand is now in a fair way being relieved."

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## British and Italian Cars Being Imported

NEW YORK CITY, Oct. 5—Agents in this city for French, German and Belgian makes of automobiles are receiving no shipments from the other side. Dealers in English makes are able to obtain a few cars and have not been as yet seriously injured by the war. The firms dealing in Italian cars, however, are in an enviable position, as the Italian government has given permission for the exportation of pleasure cars of 30 horsepower and less.

The Fiat Motor Sales Co., in particular is enjoying the benefits of Italy's neutrality. E. R. Hollander, president of the company, states:

"Our factory has shipped us more than 180 cars since war was declared. Some of these we have received, some are in the Custom House and some are afloat. There are available for our use forty-five more automobiles which the factory had made up at the time war was declared.

"As automobiles are contraband of war, our factory was unable to sell any of the stock on hand to any of the warring nations after hostilities opened, and so the automobiles were shipped to America. The government, which seems to be expecting war, has placed an embargo against the exportation of commercial motor vehicles."

E. L. Dugas of Lancia & Co., stated that several Lancia machines are in the Custom House and that another shipment is expected from Italy on October 6. He states:

"The only restriction that the Italian government has placed on our factory is that it export cars only to neutral countries."

The Peugeot Auto Import Co. is relying for its future supply upon the factory branch in London. It has several models on its salesroom floor at present.

R. W. Schuette, American agent of the Rolls-Royce, states that he expects in the next few months to handle about fifty cars, or one-sixth of the entire annual output of the British factory. He has received about a dozen chassis and there are a number now on the way.

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## Tire Prices at Before-War Level

NEW YORK CITY, Oct. 5—Not only have tire prices reached the level from which they ascended at the outbreak of the European war but one reduction has been made. The United States Tire Co. has made reductions in its chain tread casings ranging from about 4 to 15 per cent. This is a reduction from the before-the-war list, and the cut is larger on the smaller sizes. The 32 x 3 1-2 is dropped from $27.40 to $20.10 and the 36 x 4 1-2 from $49.35 to $42.

These prices went into effect and at the same time the United States returned in all other cases to its before-the-war list. When tires started downward, following their rapid ascent, United States, Goodrich and Diamond, Republic and Fisk went back to their old dealers' discounts, but kept the higher list. But inasmuch as the list is seldom adhered to by dealers anyway the maintenance of the list was considered largely theoretical.

October 1, when the United States returned to the old list, Goodrich and Diamond did likewise, and the day following, October 2, the Fisk Rubber Co. also went back to the old list. The Republic Rubber Co. is still at the higher list, but its dealers' prices are normal.

### Crude Rubber Still Cheaper

Prices of rubber continue to decline, owing to lack of buyers. It is also suggested by the *India Rubber World* that an expected loss of interest in high-class rubber goods is affecting the market.

Para was selling up to 63-65 cents a pound on September 30, which compares with 75-80 a month ago and 80-82 a year ago. The best grade plantation was quoted at 63-64 on September 30, 75-80 on September 1 and 60-61 on October 1.

# N. Y. Gets $1,462,968.86 in License Fees

NEW YORK CITY, Oct. 4—Mitchell May, Secretary of State, reports up to September 2, motorists have paid in to the state in fees for the registration of motor vehicles and chauffeurs' licenses a total of $1,462,968.86, which is nearly $200,000 in excess of the amount contributed for the same purpose during the whole of last year. So far there have been registered 161,353 motor vehicles. This is an increase of 36,090 over the corresponding period of last year. The number of chauffeurs licensed is 61,398. During all of last year there was registered only 132,450 motor vehicles and 56,702 chauffeurs.

The New York City bureau continues to hold a big lead both in the number of licenses and registrations issued. To September 8 this year the cars registered in this city were 71,407, as against 59,667 in the same period of 1913. The increase in the number of chauffeurs was more than 4,000.

The Buffalo bureau stands second, considerably ahead of Albany. To September 8, Buffalo shows 49,879 cars registered, increase over the same period of last year of more than 12,000. The Albany registrations total 38,353, an increase of a little more than 10,000.

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## Minneapolis Industry Employs 1,437

MINNEAPOLIS, MINN., Oct. 5—Industrial survey by a division of the Minneapolis Civic and Commerce Assn. shows there are six automobile manufacturing plants in Minneapolis 88 distinct motor car repair shops, 11 distinct accessory manufacturers; also, 24 gasoline filling stations outside of Bowser tanks at garages and drug stores. The employee list is a total of 1,437, of which 384 are in the factories, 863 in the repair shops, and 119 in the accessory plants. In the filling station work 71 men are employed. In addition six plants build electric batteries, employing 57 men.

The manufacturers of cars are the H. E. Wilcox Motor Co., trucks; Ford Motor Co., general; Nott Fire Engine Co., motor-propelled fire apparatus and motor pumping engines; Dispatch Motor Car Co., pleasure cars; Robinson Motor Truck Co., trucks; Braise Motor Car Co., trucks and cyclecars.

## Market Reports for the Week

Market prices this week were a little unsettled. All changes but one were lower. Tin experienced a fluctuating week. Opening at $30.90 and rising to $31.13 on Thursday, it closed with no change for the week. There was small response from copper customers, though both electrolytic and Lake were offered at reduced prices. Antimony rose to $0.10 at a gain of $0.01 1-2. There was an inquiry for 300 tons for Europe on Tuesday, causing sharp buying by the dealers here. Little buying for foreign account, however, was done for these prices are above those at London. Rubber prices were steady, especially Up-River Para, which was quoted at $0.65. Cottonseed oil saw a gradual decrease from $5.85 a barrel to $5.53, with trading a little more active at the end of the week. The petroleum market was steady with no changes. Linseed oil dropped to $0.53 on Friday at a loss of $0.03. Lard oil dropped to $0.92, or 1 cent lower than the opening price. Cyanide potash dropped from $0.32 to $0.28.

| Material | Wed. | Thurs. | Fri. | Sat. | Mon. | Tues. | Week's Changes |
|---|---|---|---|---|---|---|---|
| Antimony | .08½ | .08½ | .08½ | .08 | .08 | .10 | +.01½ |
| Beams & Channels, 100 lb. | 1.31 | 1.31 | 1.31 | 1.31 | 1.26 | 1.26 | ..... |
| Bessemer Steel, ton | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | ..... |
| Copper, Elec., lb. | .11¾ | .11 | .11 | .11 | .11⅝ | .11⅜ | —.00⅜ |
| Copper, Lake, lb. | .12 | .11¾ | .11⅞ | .11⅞ | .11⅞ | .11 11/20 | —.00 9/20 |
| Cottonseed Oil, bbl. | 5.85 | 5.61 | 5.60 | 5.59 | 5.54 | 5.53 | —.32 |
| Cyanide Potash, lb. | .32 | .32 | .28 | .28 | .28 | .28 | —.04 |
| Fish Oil, Menhaden, Brown | .40 | .40 | .40 | .40 | .40 | .40 | ..... |
| Gasoline, Auto, bbl. | .13 | .13 | .13 | .13 | .13 | .13 | ..... |
| Lard Oil, prime | .93 | .93 | .93 | .93 | .93 | .92 | —.01 |
| Lead, 100 lb. | 3.70 | 3.70 | 3.70 | 3.70 | 3.70 | 3.60 | —.10 |
| Linseed Oil | .56 | .56 | .53 | .53 | .53 | .53 | —.03 |
| Open-Hearth Steel, ton | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | 20.00 | ..... |
| Petroleum, bbl., Kans., crude | .55 | .55 | .55 | .55 | .55 | .55 | ..... |
| Petroleum, bbl., Pa., crude | 1.45 | 1.45 | 1.45 | 1.45 | 1.45 | 1.45 | ..... |
| Rapeseed Oil, refined | .82 | .82 | .82 | .82 | .82 | .82 | ..... |
| Rubber, Fine Up-River, Para | .65 | .66 | .66 | .65 | .65 | .65 | ..... |
| Silk, raw, Ital. | .. | .. | .. | .. | 4.45 | .. | ..... |
| Silk, raw, Japan | .. | .. | .. | .. | 3.60 | .. | ..... |
| Sulphuric Acid, 60 Baume | .90 | .90 | .90 | .90 | .90 | .90 | ..... |
| Tin, 100 lb. | 30.90 | 31.00 | 31.125 | 31.125 | 31.00 | 30.90 | ..... |
| Tire Scrap | .05 | .05 | .05 | .05 | .05 | .05 | ..... |

## C. of C. Has Record Show Applications

NEW YORK CITY, Oct. 7—Feeling that in the elimination of the proposed tax on automobiles against manufacturers and dealers, the Finance Committee of the Senate at Washington has properly recognized the position of the motor car industry, there was a general sentiment of appreciation at the meeting of the Directors of the National Automobile Chamber of Commerce held today at the New York headquarters.

Representatives of the Chamber visited Washington and supplied facts regarding the making and marketing of automobiles and those facts, coupled with protests from thousands of dealers and manufacturers of automobiles, parts and accessories throughout the country, it is believed, showed clearly to the lawmakers at Washington how unfair it would have been to require the automobile industry to carry such a heavy burden as the tax would involve.

While it is true that a number of the larger concerns have been very successful in the marketing of cars, it was felt that the industry should not be judged solely by the great successes of eight or ten makers, when there are 450 listed manufacturers of automobiles in the country and more than 15,500 dealers, besides 13,630 garages and the hundreds of factories making parts and accessories.

At to-day's meeting the component vehicle warranty clause was adopted and there were reports from committees on patents, traffic, commercial vehicle, good roads and shows.

While the automobile industry has suffered with other lines by the depression in trade and by the practical elimination of its export business, which last year amounted to $34,500,000, further proof that the automobile is a necessity in various lines of business and for doctors, contractors, salesmen and other business men, was furnished by the traffic department reports which showed that shipments in substantial quantities were made by practically all factories during August and September.

The Show Committee reported a record number of applications of space at the National Automobile Shows at New York and Chicago, the drawings for which will take place tomorrow in connection with the semi-annual meeting of members.

President Charles Clifton presided and the others in attendance included: S. T. Davis, Jr. (Locomobile); Roy D. Chapin and Howard E. Coffin (Hudson); C. C. Hanch (Marmon); H. H. Rice (Waverley); S. D. Waldon (Packard); Wilfred C. Leland (Cadillac); John N. Willys (Overland); H. O. Smith (Premier); E. R. Benson and A. R. Erskine (Studebaker); Wm. E. Metzger (American Electric) and Alfred Reeves, General Manager.

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## Studebaker's September Sales, $4,277,797

DETROIT, MICH., Oct. 3—The total value of the Studebaker cars sold by the thirteen Studebaker branches in the United States during the month of September was $4,277,797.92, which is the best September business the Studebaker Corp. has ever had.

The totals for each branch in dollars are not given but the percentage of increase over the corresponding month in 1913 and the showing is rather exceptionally good for several cities, while the total average gain for the thirteen branches is 232 per cent.

Gain in sales for each branch in September, 1914, according to percentage over September, 1913:

| | | | |
|---|---|---|---|
| Omaha, Neb. | 520 per cent. | Boston, Mass. | 222 per cent. |
| Kansas City, Mo. | 508 " " | Detroit, Mich. | 114 " " |
| Chicago, Ill. | 322 " " | San Francisco, Cal. | 107 " " |
| Minneapolis, Minn. | 270 " " | New York, N. Y. | 77 " " |
| Dallas, Tex. | 268 " " | Los Angeles, Cal. | 71 " " |
| Philadelphia, Pa. | 251 " " | St. Louis, Mo. | 49 " " |
| Atlanta, Ga. | 245 " " | | |

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## $50,000 of Michigan Buggy Claims Cancelled

KALAMAZOO, MICH., Oct. 5—In the matter of the Michigan Buggy Co., bankrupt, contested claims amounting to approximately $50,000 have been disallowed by Referee in Bankruptcy Banyon of Benton Harbor. The decision was made at a hearing held here.

The claims disallowed were presented by William R. Beebe, A. H. Vayo Co., Lewis Spring & Axle Co., Herbert Mfg. Co., Ernest F. Briggs, Michigan Motor Car Co., Journal Co., George F. Thompson

& Sons Buggy Co., Lewis Engelhausen, R. Kloeppel, E. F. Gerber, Owenhouse Hardware Co., H. Jacoby, F. F. Taylor & Son, C. J. Stone, J. T. Coleman, Hubbard & Hubbard, M. D. Harris, John L. Bridges & Son, A. P. Spell, Scott & Tiffany, E. Vander-Carr and Carr Auto Co. Claims allowed at the same hearing were as follows: Mayo Radiator Co., $308; F. G. Wood, $136.02; G. S. Patterson, $790.18; Reed Foundry & Machine Co., $2,500; Cecil White, $1,900; John Hamilton, $436; R. L. Carmell, $1.01; Slater & Co., $36.70; LaCross Motor Co., $8.80; B. H. Adams, $1.50; G. E. Meyers, $1.16; J. M. Nash, $74.31; H. B. Shirk, $66.63.

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## Walpole Tire Co. Earned $30,000 in August

BOSTON, MASS., Oct. 3—There were sixty present at the meeting of the Walpole Tire & Rubber stockholders. Judge Harris, one of the receivers, in the course of outlining general conditions with the company stated that there are about 800 stockholders, of whom 241 are women. He stated that the Walpole company earned $30,000 in August and for no month less than $20,000 since the receiver took charge. In 6 months $160,000 was paid off to creditors.

Auditor Keith stated that from January 31 to June 30 of this year the company earned $125,000 and that with one exception all the departments were now on good-paying basis. The good-will item has been marked down from $800,000 to $250,000. $422,000 has been paid out since the receivership, including $60,000 to the Traders Bank. Counsel Metzler stated that including the subsidiary company profits, average earnings had been $30,000 a month. The indebtedness of $1,100,000 has been reduced to $250,000. The company has about $750,000 quick assets.

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## Swinehart Co. Has $137,000 Surplus

AKRON, O., Oct. 3—The directors of the Swinehart Tire & Rubber Co. met September 30 and declared the usual dividend of 6 per cent. on the common stock of the corporation. The report to the stockholders showed a very prosperous year ending August 30. After paying all charges and dividends and charging off a large sum for depreciation, there remains a surplus of $137,000. The plants of the company are running at almost 80 per cent. of capacity and the future outlook is excellent.

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## Missouri Fair Crowds Inspect 18 Cars

SEDALIA, MO., Oct. 3—Eighteen different makers of cars were shown in the motor show at the Missouri State Fair, which closed here Saturday. The exhibits were mostly by Kansas City dealers and reports are that the fair business was exceptionally good.

The car salesmen here explained that Missouri is unusually prosperous this year. A huge corn crop is in the making and the wheat yield was one of the best in the history of the state. With the exception of a few districts in central eastern Missouri, the recent dry weather caused little harm to the growing crops.

That Missouri is rapidly becoming a motor state was shown by the attendance. On big Thursday of the fair more than 2,000 cars were parked in the grounds. Practically all of these toured to Sedalia from points as far distant as 100 miles.

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## U. S. Rubber Co. Has $8,000,000 Cash

NEW YORK CITY, Oct. 6—President Colt, in commenting upon the action of the United States Rubber Co. directors in declaring the regular quarterly dividends on the preferred and common stocks, said: "Dividends having been amply earned and the finances of the company being in an easy condition, with $8,000,000 cash on hand, I think the action of the board is not only conservative, but one that is entitled to commendation in these times. The division of $1,700,000 at this time among 15,000 stockholders will, I am satisfied, do much good."

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PITTSBURGH, PA., Oct. 3—A dividend of 1 3-4 per cent. on the preferred stock and 1 per cent. on the common stock has been declared by the Westinghouse Electric Co., payable October 15 on the preferred and October 30 on the common.

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## Motion for U. S. L. Sale Denied

BUFFALO, N. Y., October 7—Judge Hazel, in the Federal Court, denied the application of Alfred Stickney, representing the Central Trust Co., for an order authorizing the sale of the United States Light & Heating Co. The Stockholders and Protective Committee and merchandise creditors were authorized to intervene. James O'Moore, one of the receivers, and Louis Posner, attorney for the company, opposed the motion, claiming that the company would soon be in good financial standing.

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WASHINGTON, D. C., Oct. 1—A drawback allowance was today granted by the Treasury Dept. on the exportation of automobile tops manufactured by the American Top Co., Jackson, Mich., for the use of imported mohair cloth, imitation mohair cloth, jute webbing, buckram and celluloid sheets.

An allowance was also given on aluminum automobile hoods manufactured by the Michigan Stamping Co., Detroit, Mich., with the use of imported sheet aluminum, for the account of the Ford Motor Co., that city.

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NEW YORK CITY, Oct. 4—The United States Rubber Co. declared the regular quarterly dividends of 1 1-2 per cent. on the common, 2 per cent. on the first preferred and 1 1-2 per cent. on the second preferred stock, payable October 31, to stock of record October 15.

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## Defunct Hoosier Bus Line Pays Stock Dividend

INDIANAPOLIS, IND., Oct. 3—J. I. Gardner, receiver for the Rapid Transit Motor Co., has been authorized by the court to pay a dividend of 2 1-2 per cent. to stockholders and it is understood another dividend may be paid later. All creditors have been paid in full. The company formerly conducted a motor bus service in Indianapolis, but the venture did not prove successful.

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NEW YORK CITY, Oct. 7—C. Arthur Benjamin, has been made sales manager for the George W. Houk Co., Buffalo, N. Y. He was formerly general manager of the Fiat company at Poughkeepsie, N. Y.

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# August Exports Feel War Shock—Drop to $762,422

WASHINGTON, D. C., Oct. 6—Automobile exports from this country for the month of August have fallen off $1,676,208, compared with the same period in 1913, or from $2,438,630 to $762,422. This amounts to about 60 per cent. Tire exports dropped from $377,031 to $188,002, or about 50 per cent.

For the 8 months ending August exports dropped $2,218,278, or from $23,710,140 last year to $21,491,862 this year.

Figures issued by the Bureau of Statistics show the exportation during August, 1914, of 66 commercial cars valued at $124,016, 385 pleasure cars valued at $441,879 and parts valued at $196,527. In the same month last year these exports were as follows: Commercial cars, 68, valued at $109,437; pleasure cars, 1,936, valued at $1,874,312, and parts valued at $454,881.

During the eight months ending August exports of commercial cars amounted to 509, valued at $772,257, while the pleasure cars numbered at 18,884, valued at $16,612,060, and the parts $4,107,545. During the same period in 1913 the figures were as follows: Commercial cars, 730, valued at $1,260,086; pleasure cars, 18,464, valued at $18,484,396, and parts $3,985,658.

| | August, 1914 | | August, 1913 | |
|---|---|---|---|---|
| EXPORTS— | NO. | VALUE. | NO. | VALUE. |
| Automobiles | 385 | $441,879 | 1,936 | $1,874,312 |
| Commercial | 66 | 124.016 | 68 | 109.437 |
| Parts | | 196,527 | | 454,881 |
| Tires | | 188,002 | | 377,031 |
| Total | | $950,424 | | $2,815,661 |

| | 8 Months Ending August, 1914 | | 1913 | |
|---|---|---|---|---|
| EXPORTS— | NO. | VALUE. | NO. | VALUE. |
| Automobiles | 18,884 | $16,612,060 | 18,464 | $18,484,396 |
| Commercial | 509 | 772,257 | 730 | 1,260,086 |
| Parts | | 4,107,545 | | 3,985,658 |
| Total | | $21,491,862 | | $23,730,140 |

# Detroit May Have Most Perfect Traffic System

DETROIT, MICH., Oct. 3—Working in co-operation, the Detroit Board of Commerce, the Wolverine Automobile Club, the Detroit Police department and many prominent citizens have started a movement, a campaign which is to result in providing this city with the most perfect traffic system.

Frederick H. Elliott, secretary of the Safety First Society of New York was the principal speaker at a meeting held at the Board of Commerce and he told of what had been accomplished in New York. He urged the formation here of a similar society and this was decided upon, by president C. B. Warren of the chamber who will appoint a special committee to prepare a plan of action.

Among the various suggestions offered by the different speakers these are the most interesting: Licensing of all drivers of automobiles; authorization given to the city and state officials for the revocation of the drivers' licenses in case of carelessness and negligence having caused accidents; severe penalties for drivers having caused accidents while under the influence of liquor; more rigid examination of applicants for a driver's license as to their body fitness, that is to say good health; the passing of an ordinance prohibiting pedestrians to cross streets in the congested districts except within the specially marked "cross" sections reserved to pedestrians; all vehicles to be compelled to have tail-lights; prohibition of glaring head-lights; prohibition for fire engines, ambulances and other vehicles not required to observe the speed regulations when going to a fire or hospital to observe them when returning from such calls; teaching to the school children how to walk and cross the streets; display of accidents at moving picture shows and theaters, showing how accidents happen, how they can be avoided.

The suggestion of Alderman Lodge, who will introduce an ordinance at the next meeting of the common council to provide for the construction of elevated safety zones at street car stopping places, is meeting with great favor. It is contended that such elevated stopping places located at the places where at present the white safety zone lines are marked on the level street, will improve conditions to a great extent. It is suggested that these raised platforms be constructed of concrete and that they be provided with lights at both ends.

## Trego Is Assistant Manager of Knox

DETROIT, MICH., Oct. 3—Frank H. Trego, who since September 1912 has been connected with the research engineering department of the Packard Motor Car Co., has become assistant general manager of the Knox Motors Co., Springfield, Mass., assuming this post on October 1. Mr. Trego has had a long connection with the automobile industry, his factory experience dating from 1909 when he was one of the engineers with the Hudson company when its Model 20 was placed on the market. After this Mr. Trego became chief engineer of the Thomas Motor Car Co., Buffalo, and 2 years ago installed the department of research in the engineering department of the Packard company. During the last 2 years his efforts have been spent in the development of the present Packard motors.

Mr. Trego has approached the engineering problem from somewhat a different angle than many engineers, his efforts combining much practical work with theoretical and research endeavor. His policy has been one of working cars out at great length on the road and subjecting them to all kinds of hardships rather than spending all his time in the drafting room and the laboratory. It is not surprising that, because of following out this program, he has been successful in giving cars of special performance and free from many of the annoying difficulties that often follow cars developed entirely in the laboratory.

The Packard company tendered Mr. Trego a complimentary dinner before leaving.

## Asks Receivership to Prevent Marion Sale

INDIANAPOLIS, IND., Oct. 6—Suit asking $4,000 judgment, the appointment of a receiver and an order restraining the company from turning its assets over to J. I. Handley, has been filed in the Superior Court in Indianapolis against the Marion Motor Car Co. by the Standard Brass Foundry. A hearing will be held October 12, pending which time the company has agreed to not dispose of its assets. It is alleged the company has accepted a bid of $71,375 from Handley for the assets and that last December the company made an agreement with its creditors under which indebtedness was to be extended, payments to be made in installments. In October, 1913, James E. Kepperley was appointed receiver for the Marion Motor Car Co. and was discharged January 24, 1914.

## $2,700 for Hudson Landau-Limousine

DETROIT, MICH., Oct. 5—A landau-limousine is the latest addition to the line of Hudson cars made by the Hudson Motor Car Co. This new style body is built on a Hudson six-40 chassis and sells at $2,700. It combines luxury and the very latest improvements to make traveling in closed cars as comfortable as possible. This landaulet presents all the comforts of a standard limousine and the movable top may be dropped to give practically all the advantages of an open car. The top is of solid aluminum with perfect fitting waterproof joints to prevent the possibility of a leak. Leather is only used in a portion of the back quarter.

## A Delaware Gasoline-Electric Truck

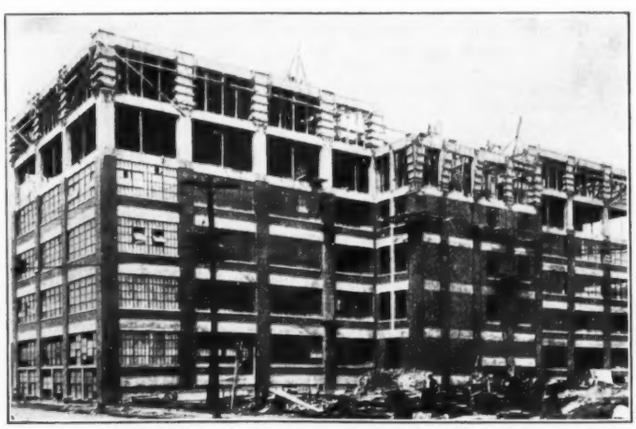
WILMINGTON, DEL., Oct. 5—The Standard Arms Mfg. Co., which is located here, has begun the manufacture of motor vehicles, and under sub-contract with the Field Omnibus Co., has just delivered a twenty-eight-passenger motor bus to the Springfield Transit Co., of Springfield, Mass. Power is furnished by a gasoline engine, with electric generator set, electric motors driving the wheels. This is the second machine the company has turned out.

## Detroiter Now $985—Rebate to Buyers

DETROIT, MICH., Oct. 5—Since the first day of this month the price of the Detroiter cars has been reduced from $1,050 to $985. All purchasers of 1915 cars since August 1 are requested to call at the dealer or distributer from whom they purchased their car and they will be given a cash rebate of $65. This price reduction was expected by the dealers, inasmuch as at the annual convention held in July President C. S. Briggs of the Briggs Detroiter Co. stated that the price of the 1915 model would be reduced as soon as the production had reached twice the rate of cars made during a specified number of months in 1913.

## No Separate Truck Show in Boston

BOSTON, MASS., Oct. 3—There will be no separate motor truck show in Boston next March, but a combined passenger car and commercial vehicle exhibition at the one time in Mechanic's building. This was the result of the annual fall meeting of the Boston Automobile Dealers' Assn. and the Boston Commercial Vehicle Dealers' Assn. held this week. The matter was given careful consideration and the members of the latter organization felt that a separate show would be unwise, and they agreed to accept space in the basement of Mechanic's building for their trucks and delivery wagons. Much of the space for passenger cars has already been spoken for by the Boston dealers, and there are new applicants



New factory of Hyatt Roller Bearing Co., Newark, N. J., to provide for the increased demands for its product. The new structure is 75 by 200 feet and will comprise six stories and a basement. The building is of cement and steel construction, conforming with the general plan of the others in the group. The work now has reached the top story and the machinery already is being placed on the lower floors

coming in every day. Manager Chester I. Campbell of the show states that he will be able to combine the truck and passenger car shows without any great trouble. It will not be possible to have such a big truck show as formerly, but it will be big enough to make it a feature. E. A. Gilmore resigned as a director of the commercial association and Frank Crockett of the Knox was elected to fill the vacancy.

## Mitchell Averages 15.5 M.P.G. for 1,946 Miles

NEW YORK CITY, Oct. 6—The Mitchell 35-horsepower light four car, which left Chicago September 23, in an effort to cover 250 miles a day with its bonnet sealed, arrived in this city on September 30, after covering 1,946 miles in 170 hours and 5 minutes. The car averaged 15.5 miles to the gallon of gasoline and 300 miles to the quart of oil.

The car left for Philadelphia, Baltimore, Washington, Wheeling and then back to Pittsburgh, the purpose being to drive the car with sealed bonnet 7,500 miles, the average mileage made in a year by an owner.

## National to Continue Four-Cylinder

INDIANAPOLIS, IND., Oct. 5—To meet the demands of those desiring a four-cylinder car, the National Motor Vehicle Co., Indianapolis, Ind., will continue their series V-3 during the coming season. It was stated in THE AUTOMOBILE for September 24 that a six only would be marketed. The motor dimensions of the six are 3.75 by 5.5 and it sells for $2,375 and $150 extra with wire wheels.

## Klaxon Reorganizes Sales Organization

NEWARK, N. J., Oct. 6—The selling organization of the Lovell-McConnell Mfg. Co. has been reorganized and enlarged. The sales and advertising departments have been merged into one. Additional territorial managers have been appointed.

The new selling organization will direct both sales and advertising and will be in charge of a committee composed of W. O. Turner, secretary of the company; C. L. Mead, Advertising Manager, and C. F. Brown. F. M. Hayes, who formerly represented the Klaxon in the West and in New England, will continue in charge of the New England territory. R. G. Coghlan has been transferred from the Mississippi territory to take charge of the Eastern territory, which includes New York, New Jersey, Pennsylvania, Delaware, Maryland and the District of Columbia.

W. J. Whaley, who formerly had charge of the sales for the Atlanta branch of the Western Electric Co., has been given the Southeastern territory. This includes Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Tennessee.

Charles Johnson, who for the last 3 years has acted as outside representative of the president, is now manager of the newly established Detroit office in the Dime Bank Building of that city. Mr. Johnson has charge of the factory business in Detroit, Toledo and Michigan cities, and of the sales in Michigan and eastern Canada. He will also supervise the work of the new permanent service station which has been established in Detroit at 108-114 Jefferson avenue and which is in charge of W. G. Packard.

R. L. Wilkinson continues in charge of the Middle Western territory with headquarters in Chicago. This territory includes the states of Wisconsin, Illinois, Indiana, Ohio, West Virginia and Kentucky.

The Mississippi territory has been divided. W. P. Coghlan, late sales manager of the Moon Motor Car Co. of New York, has been placed in charge of the northern division, which will henceforward be known as the Northwestern territory. This includes the states of Minnesota, Iowa, North Dakota, South Dakota, Nebraska, Wyoming, Montana and Missouri, except Kansas City.

Arthur E. Francis, formerly of the Champion Spark Plug Co., Toledo, has been assigned to the Southwestern territory. This includes the city of Kansas City, Mo., and the states of Arkansas, Kansas, Oklahoma, Texas, New Mexico, Colorado and Utah.

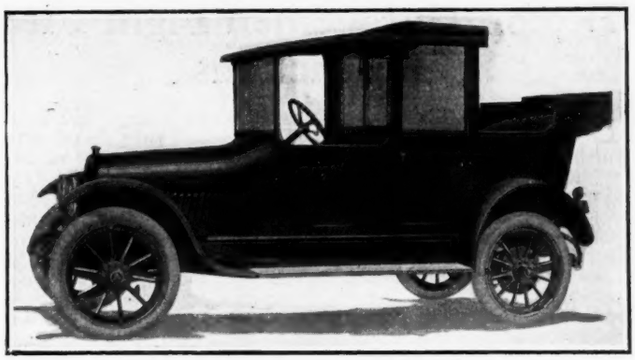
The Pacific Coast territory, including western Canada, will be in charge of W. R. Johnston, formerly assistant general manager of the Stromberg Motor Devices Co. of Chicago, and for the past 3 years Pacific coast manager for the Stewart-Warner Speedometer Corp.

## New Rayfield Averages 24.2 M.P.G.

CHICAGO, ILL., Oct. 3—Under the supervision of F. E. Edwards, chairman of the technical committee of the Chicago Automobile Club, the Findeisen & Kropf Mfg. Co., of this city, manufacturer of the Rayfield carbureter, held a test last Thursday that brought out officially the merits of the model G Rayfield carbureter in the way of economy, acceleration, low throttling, speed and hill-climbing without any change in adjustment.

The car used was a 1915 model 80 Overland, four-cylinder, 4 1-8 by 4 1-2, and weighing 3,620 pounds, carrying four persons. Charles Merz, former race driver, was the pilot, and besides Mr. Edwards the car carried S. D. Hirschl, chairman of the technical committee of the Chicago Motor Club, and E. A. Rossow, manager of the Chicago Rayfield branch.

On 1 gallon of 58 Standard Oil gasoline the car ran 24.2 miles. In the way of acceleration a speed of 30 miles an hour from a standing start was attained in 12 1-5 seconds. Then the Overland throttled to 3 miles an hour on high and quickly accelerated to 42 miles per hour. On Hubbard's hill, about the only grade about Chicago suitable for such tests, the Overland went from a standing start to a speed of 18 miles per hour on high at the top. The next hill trial was from a flying start and the speed of 12 miles per hour at the bottom was increased to 18 at the top.



New Hudson landau-limousine which sells for $2,700 mounted on the six-40 chassis

## Findlay Men Rehabilitate Adams Truck Co.

FINDLAY, O., Oct. 5—Through the efforts of the Findlay Business Men's Assn. the Adams Bros. Truck Co., of this city, will be reorganized and remain in Findlay. W. D. McCaughey is the receiver now. The business men's association raised $12,500 in new subscriptions, and Murry Irwin, of the Louis Spring & Axle Co., Jackson, Mich., will take a like amount of stock and probably become the general manager. It is the plan to settle with creditors at 20 cents on the dollar, or 40 cents in stock, rather than have the company go through an expensive receivership. The entire matter will probably be closed up this week.

## Receiver Named for Crescent Motor Co.

CINCINNATI, O., Oct. 2—L. J. Howe of this city has been appointed receiver of the Crescent Motor Car Co. in the United States District Court as the result of the filing of an involuntary bankruptcy petition against the company by its creditors. This company is successor to the Ohio Motor Car Co.

NEW YORK CITY, Oct. 6—The Motor Contest Dealers' Assn. will hold its first dinner at Healey's restaurant on the evening of October 17.

## Howland Addresses Electric Vehicle Assn.

NEW YORK CITY, Sept. 30—Ellis L. Howland, secretary of the Motor Truck Club of America, spoke to-night on the subject of "Practical Ideals in Electric Vehicle Promotion" before the Electric Vehicle Association of America at its monthly meeting.

Mr. Howland claimed that the criterion for judging motor trucks should be efficiency first and economy of operation second, rather than judging on a dollar cost basis in which it is often impossible to get actual horse costs.

DETROIT, MICH., Oct. 5—F. R. Bump, who has been connected with the bicycle business and later with the automobile business from the time the first automobiles were made in the United States, has joined the Studebaker Corp. and will shortly have charge of an important department of the firm.

CHICOPEE FALLS, MASS., Oct. 5—G. W. Kerr, for a number of years body engineer of the Stevens-Duryea Co., Chicopee Falls, Mass., has announced his resignation from that concern.

# Boston Garagemen Fight Fire Restrictions

BOSTON, MASS., Oct. 3—When the new garage law went into effect last Thursday it was found that there were some defects in it, and at once an effort was started to secure modifications of the law. This may be done by the Fire Hazard Commissioner who has the power to make or suspend rules and regulations. John O'Keefe of Lynn, Mass., has just been appointed to the position and the representatives of the electric vehicle associations got busy and asked for a hearing on the regulation that prohibited the use of electricity in garages to some extent. It seemed at first as if there could be no storing of electric and gasoline vehicles in any garage, and this was pointed out as a hardship to the owners of garages and the electric vehicle industry as well.

The hitch in the law came over the regulations governing electricity which would exclude charging stations in garages where gasoline vehicles were cared for. So an application was made to Commissioner O'Keefe, on behalf of the Electric Vehicle Assn. and the Electric Motor Car Club. He gave a hearing on the matter at the State House during the week which was attended by F. A. Barron, of the insurance department of the General Electric Co., Schenectady, N. Y.; W. H. Blood, Jr., of Stone & Webster Engineering Corporation, Boston; J. A. Hunnewell, Lowell Electric Light Corporation, and chairman of the New England section of the Electric Vehicle Association of America; W. E. Russell, C. M. Greene, A. H. Abbott, of the General Electric Co.; T. J. Pace, Westinghouse Electric Co. of Pittsburgh; C. H. Miles, Boston Edison Co.; I. Osgood, Boston Board of Fire Underwriters; C. S. Lawler, of the Factory Mutual Insurance Co. and President Day Baker, of the Electric Motor Car Club of Boston.

Mr. Baker and his electric colleagues showed that so far as had been learned no garage fire ever originated from electric charging apparatus, and that with the improved new methods of installation fires would be practically impossible.

## Abbott to Build Sixes Only for 1915

DETROIT, MICH., Oct. 6—The Abbott Motor Co., will manufacture only six-cylinder cars for 1915. At the present time a big six having a Continental motor 3 3-4 by 5 1-2 and a wheelbase of 130 inches is being delivered with a five- and also a seven-passenger body, the former costing $2,090 and the latter $2,190. A light six to weigh about 2,100 pounds with a 116-inch wheelbase and a motor probably 3 by 5, will be marketed early next year and the Abbott company is endeavoring to show this car for the first time at the New York show. The company contemplates manufacturing 2,500 cars for the 1915 season.

## Weed Co. Granted Perpetual Injunction

NEW YORK CITY, Oct. 5—The Parsons Non-Skid Co., Ltd., and the Weed Chain Tire Grip Co. have been granted a perpetual injunction in their suit against the Leather Tire Goods Co., Inc., in which they alleged infringement of patent No. 723,299. Judge Hough handed down the final decree in the U. S. District Court for the Southern District of New York, ruling that the Leather Tire Goods Co. had infringed patent No. 723,299, covering the well-known Weed tire chain construction. The injunction prohibits the manufacture or sale of any infringing devices and in particular the Side Chain Kant Skids made by the Leather Tire Goods Co.

The decree states that the Parsons and Weed companies are to recover from the defendant all gain and profits from the manufacture and sale of infringing devices. Karl S. Dietz is made special master to determine the amount of such damages and report to the court. The defendant is ordered to submit to the court an account of its business in such infringing devices and to report from time to time to the special master. The Weed and Parsons companies are to recover costs of the suit from the defendant.

## Indiana to Quash Invalid Ordinances

INDIANAPOLIS, IND., Oct. 5—Attorneys who have been conducting a quiet investigation, have found that in many municipalities throughout the state, ordinances have been enacted that conflict with the state motor law. It is expected that a series of test cases will be brought, with a view to having declared invalid many ordinances that are obnoxious.

There is a specific provision in the state law that no municipality shall enact an ordinance that conflicts with the state law. In spite of this fact numerous traffic measures have been adopted and ordinances have been passed attempting to fix speed limits lower than those permitted by the state.

The question also probably will be raised that it is unlawful to tax automobiles as personal property. The state motor law provides that aside from the annual state license, no motor car shall be subject to any other tax or license. Every city and county, however, has continued to require that motor cars be returned for taxation as personal property.

## Boston Dealers Cut Employees' Insurance Rate

BOSTON, MASS., Oct. 3—The committee comprising J. H. Johnson of the Buick, J. W. Bowman of the Stevens-Duryea and Joseph Donovan of the Studebaker, representing the Boston Automobile Dealers' Assn. who were asked to try to secure a reduction in the insurance rate under the employers liability law, have been successful. The committee secured a new rate for all automobile dealers in New England at a substantial reduction from the old rate that the automobile men were paying to the insurance companies.

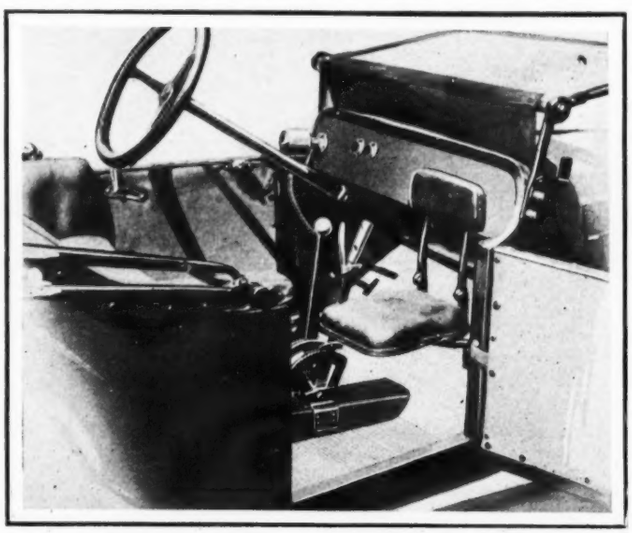
## Senate to Probe Truck Purchase

WASHINGTON, D. C., Oct. 5—That the action of the Postmaster General in awarding to the White Co., of Cleveland, the contract for furnishing the Washington city post office with seven motor trucks will be the subject of a Congressional inquiry is indicated by a resolution introduced in the Senate by Senator Townsend of Michigan. Several bidders who submitted propositions have made protests against the awarding of the contract to the White Co. and have brought Congressional influence to bear to ascertain certain facts from the Postmaster General regarding the awarding of this contract. It is understood Senator Townsend is going to press his resolution and to that end is likely to deliver a strong speech in the Senate on the subject in order to force the Democrats to pass the resolution. The text of the resolution follows:

"Resolved, That the Postmaster General be, and hereby is, directed to send to the Senate at the earliest possible date all information in his possession or in the possession of the Post Office Department in any manner bearing upon the action of the department inviting the manufacturers of motor trucks, some time prior to September 8, 1914, to submit bids for supplying such trucks for the use of said department. Such information to include the department's invitation to bidders; copies or originals of the respective bids received; the action of the department in forming a committee to pass upon the bids; how, by whom appointed and under what instructions the committee acted; the full report of the committee and the reasons for its award of contract or contracts to other than the lowest responsible bidder, if such contracts were made, and all correspondence or facts that will tend to give the fullest possible information regarding this transaction."

## Motor Products Co. Absorbs Cricket

DETROIT, MICH., Oct. 7—*Special Telegram*—The Motor Products Co. has absorbed the Cricket Cycle Car Co. and will continue to make the Cricket cars in two models, a pleasure and a commercial vehicle, the price to be around $300.



Saxon with folding seat for extra passenger

# De Palma Thrills 40,000 at Trenton

TRENTON, N. J., Oct. 2—Ralph DePalma in his Mercedes, J. Lecain in a Chevrolet and W. D. Morton in a Mercer special were prize winners at to-day's races at the Fair Grounds here where over 40,000 people watched a program of good racing on the half-mile track. DePalma won three events and doubtless would have captured some others had the water pump on his Mercedes not gone out of commission. Lecain also was unfortunate in that when driving in the 25-mile race the axle of the Chevrolet cracked, a wheel came off, and the car struck a bale of straw which was used as a protection on the turn. Nobody was injured. C. Bergdoll, driving a Bergdoll special, was put out of the winning due to his car catching fire from the carbureter.

The summaries follow:

**5 Miles, Class C, 161 to 230 Cu. In.**

| CAR | DRIVER | TIME |
|---|---|---|
| Chevrolet | J. Lecain | 6:32¾ |
| Roberts | M. Roberts | 6:37 |
| Chevrolet | G. C. Jessup | |

**10 Miles, Class C, 300 Cu. In. and Under**

| | | |
|---|---|---|
| Mercedes | Ralph DePalma | 13:05½ |
| Chevrolet | J. Lecain | 13:24 |
| Chevrolet | G. C. Jessup | 13:31 |

**5 Miles, Class E, 450 Cu. In. and Under**

| | | |
|---|---|---|
| Mercedes | Ralph DePalma | 6:35 |
| Erwin | G. C. Bergdoll | 6:36 |
| Roberts | M. Roberts | 6:37 |

**10 Miles, Class D, Free-for-all**

| CAR | DRIVER | TIME |
|---|---|---|
| Mercedes | Ralph DePalma | 12:39½ |
| Erwin | G. C. Bergdoll | 12:42 |
| Isotta | R. N. Brown | 12:54 |
| Roberts | M. Roberts | |

**10 Miles, Class E, Free-for-all Handicap**

| | | |
|---|---|---|
| Chevrolet | J. Lecain (10s) | 13:00½ |
| Erwin | G. C. Bergdoll (30s) | |
| Roberts | M. Roberts (30s) | 13:22¼ 13:23 |

**25 Miles, Class E, Free-for-all**

| | | |
|---|---|---|
| Mercer | W. D. Morton | 30:50½ |
| Erwin | G. C. Bergdoll } withdrew | |
| Chevrolet | J. Lecain } accidents. | |

## An Election Day Meet at Brighton

NEW YORK CITY, Oct. 6—There will be an automobile race meet on election day, November 3, at Brighton Beach. This is being promoted by O. V. Matthews.

## Tetzlaff Breaks Grand Rapids Track Record

GRAND RAPIDS, MICH., Oct. 6—Teddy Tetzlaff broke the mile record for the Comstock park track here Sunday, making the mile in his Blitzen Benz in 50 seconds flat, the former record being 52 2-5 seconds. About 6,000 persons witnessed the program offered by Tetzlaff and others in the competition promoted by E. A. Moross of Indianapolis.

The summary:

| CAR | DRIVER | TIME |
|---|---|---|
| **3-Mile—For Local Drivers** | | |
| Packard | White | 3:29 3-5 |
| Buick | Cairow | |
| Mercedes | Vandenberg | |
| **Free-for-All—Three 3-Mile Heat** | | |
| **FIRST HEAT** | | |
| Maxwell | Carlson | 2:59 1-5 |
| Maxwell | Tetzlaff | |
| Burman | Kennedy | |
| **SECOND HEAT** | | |
| Keeton | Callaghan | 2:50 1-5 |
| Burman | Kennedy | |
| Maxwell | Tetzlaff | |
| **THIRD HEAT** | | |
| Maxwell | Carlson | 2:44 2-5 |
| Burman | Kennedy | |

| CAR | DRIVER | TIME |
|---|---|---|
| **3-Mile—450 Cu. In. and Under** | | |
| Maxwell | Tetzlaff | 3:09 |
| Burman | Kennedy | |
| Keeton | Callaghan | |
| **3-Mile—Non-Stock—450 Cu. In.** | | |
| Maxwell | Tetzlaff | 3:08 1-2 |
| Burman | Kennedy | |
| Keeton | Callaghan | |
| **To Lower Track Record** | | |
| Benz | Tetzlaff | 50 sec. |
| **50-Mile Free-for-All** | | |
| Maxwell | Tetzlaff | 52:36 |
| Great Western | Tidmarsh | |

## New Track Records at Oklahoma Fair

OKLAHOMA CITY, OKLA., Oct. 5—Louis Disbrow, Heine Ulbricht, Johnny Raimey, T. Milton, J. Cleary and Eddie Hearne closed the entertainment features of the Oklahoma State Fair here Friday and Saturday before crowds conservatively estimated at 20,000 each day. Disbrow drove his Simplex Zip; Raimey, the Case Comet; Cleary, the Scat; Milton, the Mercer; Ulbricht, the 120-horsepower Special, and Hearne, the Case.

Two new automobile half-mile dirt track records were made Saturday. Eddie Hearne lowered Burman's record of 5:55 1-5 for 5 miles, going the distance in 5:47, and John Raimey lowered Burman's record for 3 miles from 3:32 3-5 to 3:25 2-5.

On Friday, Louis Disbrow established a new half-mile dirt track record when he drove 2 miles in 2:13 3-5 or three-fifths of a second better than the record made by him at Toledo, Ohio, last June.

One of the best exhibits at the Oklahoma State Fair this year was the automobile exhibit. The show was under the auspices of the Oklahoma City Automobile Assn. One large building, formerly used for agricultural purposes, containing 22,080 square feet, was given over to the automobile enthusiasts and more than seventy different makes of 1915 cars were exhibited.

## Denver Club Back in A. A. A. Fold

DENVER, COLO., Oct. 1—After remaining out nearly a year, the Denver Motor Club has renewed its affiliation with the American Automobile Assn. The reuniting of Colorado's leading motor and good roads organization with the national body was brought about largely through the efforts of Ralph W. Smith, Colorado vice-president of the A. A. A. The club withdrew on account of dissatisfaction with the administration of the A. A. A. and the belief that this section of the country was not receiving sufficient benefits in return for the dues paid into the national organization's treasury by motorists living this far west. This action adds about 1,000 to the A. A. A. membership.

## Transcontinental Run for Electric Vehicles

NEW YORK CITY, Oct. 7—Plans are being made by the Electric Vehicle Assn. of America for a transcontinental run over the Lincoln Highway next summer, in which both passenger and commercial electric vehicles will participate. The series of mileage tests to be held on the indoor track at Grand Central Palace, New York, during the Electrical Exposition and Motor Show which opened today have been arranged largely to furnish the mileage data needed for preparing a schedule.

The principal mileage test at the Electrical Exposition and Motor Show will be made by the General Vehicle Co., which will operate one of its 1,000-pound delivery wagons continuously during the 10-day period of the show. Two batteries will be provided and while one is in use the other will be recharged. This plan is in use by a number of companies working under high pressure.

Among the companies who will exhibit are the following concerns: Ward, General Vehicle, Anderson, Baker, Commercial Truck, Electric vehicle companies and the Gould, Edison, Philadelphia and the National Carbon storage battery companies.

## Now Kalamazoo Is to Have a Speedway

KALAMAZOO, MICH., Oct. 3—It is reported that with the success of the automobile races at Kalamazoo recently, exceeding the hopes of the directors, plans are already being made for the building of a 2-mile automobile speedway together with a grandstand and bleachers that will accommodate 50,000 people. The Kalamazoo County recreation park committee met recently and decided to take up immediately the proposition. The cost of the improvements will probably exceed $200,000. It was also decided to hold the races for 2 days next year. Labor Day is to be included in the dates and a 100 mile race for a large purse with a series of other races will be scheduled.

**With the constant increase in demand for its product, the Maxwell Motor Company has been forced to utilize every available building for the manufacture of its cars. The tent in the photograph was purchased by the Maxwell company for a temporary paint shop, and will be used as such until a new building can be constructed. Under this immense canvas may be seen row after row of freshly painted axle housings, six or seven hundred of them ready to be placed in the finished cars. No other part of the car is painted in the tent, other buildings being used for the purpose. In the foreground can be seen workmen making the cement bases for a spacious building which, when finished, will take the place of the tent and will be the finishing room for the factory. Enameling and painting will be done in this new building**

# War Golden for the German Industry

## All Private Motor Vehicles Bought for Cash by Government—Factories Working Full Tilt and Overtime—Enormous Impetus for Whole Trade Confidently Expected After War Is Over

*This is the translation of a letter just received—October 7—from a German subscriber for THE AUTOMOBILE who is anxious that Americans should know the exact conditions existing in the Fatherland; that is, as they existed at the date of his letter, September 2.*

By Kurt Goldstein

BERLIN-CHARLOTTENBURG, Sept. 2—In receipt of your bill of July 30 I beg to inform you most cordially that it unfortunately is impossible for me at the present time to forward you the amount of $5 in payment of my subscription for the coming year, as all money remittances to America have been prohibited. I must ask you to continue nevertheless to mail me your journal as before, and you will then receive the amount of the subscription promptly as soon as the ordinary traffic is again established. I do not wish to inclose the amount in this letter, as the letter post is too unsafe and, indeed, I do not know whether it will reach you.

On this occasion I would like, however, to let you know something about the general situation here, as this certainly will interest you and possibly also your readers, especially as so much distorted information is going abroad.

Before this reaches you, the daily press will have informed you of the victories of our German army in France and in Russia. I only repeat briefly: The French are defeated over the whole line and our troops stand within 80 kilometers of the gates of Paris. The Russians were defeated by the Austrians in the battle of Krasnik, and by the German troops in the battle of Tannenberg, where alone 70,000 prisoners were taken and the entire artillery of three army corps was captured. These communications are official and therefore completely reliable. The reports of victories have stimulated all business, and I do not exaggerate when I state that here in Berlin, the capital, apart from the enormous enthusiasm for the war, no other effects of the war condition are noticeable.

From the first day of mobilization, everything was in perfect order, and there were no counter-currents against the war. The information spread abroad about socialistic mutterings and of battles lost by our German troops is purely fictitious. Further details on these points you will of course get through the daily press, as already mentioned. But I would like to let you have some facts about the automobile industry.

At the declaration of war the army administration at once requisitioned about 30,000 automobiles; even the figure of 40,000 is mentioned. Especially, every commercial vehicle, this including all the omnibuses of the local General Omnibus Co., was at once turned to military uses. They are employed by the commissariat for the transportation of food; also as ammunition wagons and in the fresh-meat service for the firing line, etc.

Over the entire country so-called Immobile Motor Vehicle Commandoes have been distributed, which have charge of the equipping of these vehicles in accordance with the rules and specifications of the army authorities. Pleasure cars were ordered to be placed at the disposal of the army on the very first day of the mobilization and most of the cars in good condition were bought. The purchase price is paid at once in cash—as in fact everything bought by the army is settled for in two to four weeks' time.

The automobile factories, especially those making trucks, work for the army administration with all the forces they can command, and these factories as well as those making parts and accessories are therefore tremendously busy. My own firm, for example, reached during the month of August the highest monthly volume of trade ever experienced. And, although a great deal of material is used, the army authorities do not by any means order anything promiscuously.

The many members of the automobile commerce who have been called to arms are also employed in the army according to their capabilities, and one finds therefore today in the motor vehicle batallion the same gentlemen who during their civilian days were most busy with automobile affairs. It is thus evident that the automobile industry will derive great benefits from this war; not only for being kept busy during the hostilities but also because most of the automobile owners whose vehicles have been bought for the army will be compelled to buy new vehicles later. On the unofficial exchange there is therefore also great demand at present for stock in the automobile manufacturing companies.

After the first reports of victories many private persons even went so far as to place orders for new vehicles at once, and those factories which at first had cancelled orders for parts have now revoked this precautionary measure.

I am quite willing, if you wish it, to send you further information, as I consider it my duty as a German to see that some veracious statements reach the press of foreign countries.

The moment Germany once again gets into regular communication with the United States you will learn the true condition of many things which are now under cover, and there will certainly then be great wonderment over the manner in which Germany went to war.

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### Second Used Car Report Out

CHICAGO, ILL., Oct. 6—The second issue of the Used Car Central Market Report published by the Chicago Automobile Trade Assn. has been issued. This is a 46-page issue of the report which was described in THE AUTOMOBILE, September 3, page 438, and is a comprehensive market report to tell the dealer the amount to allow in taking a used car of any year and make in trade for any machine. The information contained on the pages of this issue is strictly up-to-date, being compiled from prices obtained for used cars during the months of April, May and June. One hundred gasoline vehicles and fourteen electrics were listed in the first issue and the second has 125 gasoline and fourteen electrics. The number of sales upon which the information is based is 825 ending June 30 and the field of used cars covered is 25 per cent. larger.

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### Appraisal Shows $181,000 for Voiturette Co.

DETROIT, MICH., Oct. 7—*Special Telegram*—An inventory taken by the Detroit Trust Co., shows an appraised value of $181,000 for the American Voiturette Co. assets, against the company's book inventory of $444,000. The direct liabilities total $295,000 and the indirect liabilities, $213,000.

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### Clubs to Tour to New York Parade

NEW YORK CITY, Oct. 5—Invitations were sent yesterday to all of the automobile clubs within 400 miles of New York City to tour to New York as bodies and compete for club prizes in the Tercentenary Automobile Pageant on the night of October 28.

In addition to the list of clubs, letters have been sent by A. G. Batchelder, chairman of the executive committee of the American Automobile Association, to more than 2,600 car owners in the Metropolitan district who are members of the A. A. A.

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BUFFALO, N. Y., Oct. 1—*Special Telegram*—With liabilities of $8,557.46 and assets of $2,316.41 up-to-date Auto Body and Specialty Co., Inc., of Buffalo, filed late today voluntary petition of bankruptcy here in Federal court.

# Factory Miscellany

**CONTINENTAL Motor's Large Additions**—Large additions are being made to the Detroit plant of the Continental Motor Manufacturing Co. Several new buildings have just been completed; others are under construction, and ground is just being broken for still others. Over 50,000 square feet of ground will be covered by these structures when all are finished. A new garage and steel stamping addition are already nearly ready. A wing to the heat-treating department has progressed as far as the completion of the structural steel work. This building will double this department's capacity. The largest unit of the new buildings is a continuation of the machine shop—already one of the largest structures of its kind in the world. This addition increases the floor space by thousands of square feet, wherein almost a quarter million dollars' worth of special Continental machines will be installed. The great extension to the experimental laboratories completes the additions. At the present time work on this has just begun, the foundation alone being finished. This enlarged experimental department, adding as it does over 7,000 square feet of ground space to the existing laboratories, will give the Continental company unequaled facilities for research work.

**Hupp's Daily Schedule 75 Cars**—Since September 28 the Hupp Motor Car Co., Detroit, Mich., has been operated on an output schedule of 75 cars daily.

**Gabrielson Co. Will Build**—The Gabrielson Car Parts Mfg. Co., Jamestown, N. Y., recently incorporated with a capital of $35,000, will erect a factory for the manufacture of automobile radiators.

**Hyatt Acquires New Detroit Site**—The Hyatt Roller Bearing Co., Detroit, Mich., has purchased a lot 165 by 161 feet on Grand boulevard and Cass avenue, where its new office building will be erected.

**McQuay-Norris Opens Plant**—The McQuay-Norris Mfg. Co., St. Louis, Mo., maker of the Leak Proof piston ring, opened its new factory on Locust street, in Automobile Row this week. New machinery has been installed at a cost of $25,000. The offices will take up a greater portion of the second floor together with the wholesale and out-of-town stock. The factory is on the ground floor.

**White's Seattle Branch Plant**—The White Co., Cleveland, O., has established a factory branch in Seattle, Wash., opening salesrooms at 1514 Third avenue, in the heart of the business district. The branch is in charge of E. W. Hill, who is in charge of the White factory interests in the Pacific Northwest, and R. G. Hubner, auditor for the White factory in this district. The Seattle branch will serve the entire States of Washington and Idaho.

**Ford's New Cleveland Plant**—The announcement is made by the Ford Motor Co., Detroit, Mich., to the effect that the new Cleveland, O., assembling branch, which will be erected on East 117th street, will cost in the neighborhood of $500,000. Railroad tracks will be run into the second floor of the structure and the roof will be used for testing purposes. According to H. N. Dunbar, the branch manager, the plant will be ready for occupancy early next summer.

**Marathon Electric Starts Operations**—The Marathon Electric Mfg. Co., Wausau, Wis., has started initial operations and is turning out a large line of electrical goods, including motors, dynamos, generators, etc., of the small type. The plant is being enlarged and a new power house erected. The company's quarters consist of the former forest products laboratory built by the Government 3 years ago and abandoned last fall at the conclusion of its pulp wood research work.

**Sta-Rite Carbureter Co. in Utica**—E. W. Mason, who purchased the patterns, good will, etc., of the defunct Watt Carbureter Co., Holly, Mich., is organizing a new company, which is to be located in Utica, Mich., and will manufacture the Sta-Rite carbureter. Mr. Mason is asking local stockholders of the bankrupt Watt company to take the same amount of stock they held in the old company in the new one in settlement of their claims, and it is said that most of them have accepted the proposition.

**Bukolt Co. Building.**—The Bukolt Mfg. Co., Stevens Point, Wis., which brought out a new device known as the Highway tire strap, is planning to erect a large factory addition late this fall or early next spring. A site 74 by 150 feet in size has been purchased and tentative plans call for a three-story structure covering nearly all of the new acreage. The concern intends to increase its capital by $50,000. Practically all of the issue has already been spoken for by Stevens Point capital.

**Wants Tire Plant in Canton**—Leslie Dunn, president of the York Co-operative Tire & Rubber Co., of New Orleans, wants to establish a factory in Canton, O., capable of turning out 2,000 finished tires a day. He wants to bring his shops as well as a cotton factory, where tire fabric can be made. He asks the Chamber of Commerce to give him 10 acres of land on which to erect the buildings. He also wants aid in disposing of remaining stock in the firm. His plan is unique. He would have the company include automobile owners only, each stockholder to be limited according to the number of tires he consumes.

## The Automobile Calendar

Oct. 3-10.....Cincinnati, O., Show.
Oct. 5-12.....St. Louis, Mo., Show, Forest Park Highlands.
Oct. 7-8-9-10.....Detroit, Mich., First Truck Convention of Motor Truck Manufacturers', Dealers' and Owners' Organization; promoter, Motor Truck Club of America.
Oct. 7-17.....New York City Electric Vehicle Show, Grand Central Palace.
Oct. 10.....Medford, Mass., Track for Light Cars, Combination Park.
Oct. 10-17.....Boston, Mass., New England Light Car and Cyclecar Show, Horticultural Hall.
Oct. 17.....New York City, Motor Contest Dealers' Assn., First Dinner, Healy's Restaurant.
Oct. 17.....Los Angeles, Cal., Show, Shrine Auditorium.
Oct. 17-23.....Los Angeles, Cal., Show, Shrine Auditorium.
Oct. 17-24.....Pittsburgh, Pa., Automobile Show, Auto Dealers Assn., Inc.
Oct. 17-Nov. 1....Dallas, Tex., Show, State Fair Grounds, Dallas Automobile Dealers' Assn.
Oct. 19, 20, 21....Philadelphia, Pa., Elec. Veh. Assn's Convention.
Oct. 19-26.....Atlanta, Ga., American Road Congress of the American Highway Assn. and the A. A. A.
Oct. 23-24.....Peoria, Ill., Illinois State Assn. of Garage Owners; Semi-Annual Convention.
Oct. 28.....New York City, Commercial Tercentenary Celebration.
Oct. 28-31.....Milwaukee, Wis., Convention, Northwestern Road Congress, Auditorium.
Nov.....El Paso, Tex., Phoenix Road Race, El Paso Auto Club.
Nov. 8-9.....El Paso to Phoenix, Ariz., Automobile Race.
Nov. 8-11.....Shreveport, La., Track Meet, Shreveport Auto Club.
Nov. 26.....Corona, Cal., Road Race, Corona Auto Assn.
Dec. 1-4.....New York City, Annual Meeting of the American Society of Mechanical Engineers.
Jan. 2-9.....New York City, Annual Automobile Show, Grand Central Palace
Jan. 3-10.....Buenos-Aires, Argentina, Grand Prize of Argentina.
Jan. 9-16.....Philadelphia Automobile Show.
Jan. 23-30.....Chicago, Ill., Automobile Show, First Regiment Armory.
Jan. 30-Feb. 6....Minneapolis, Minn., Show, National Guard Armory, Minneapolis Automobile Trade Assn.
Feb. 15-20.....Omaha, Neb., Show, Auditorium, C. G. Powell.
Feb. 22.....San Francisco, Cal., Vanderbilt Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.
Mar. 6-13.....Boston, Mass., Show, Mechanics Bldg., Boston Auto Dealers Assn. Boston Commercial Motor Veh. Assn.
Mar. 7.....San Francisco, Cal., Panama-Pacific Exposition, Grand Prize Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.
Mar. 14.....San Francisco, Cal., Panama-Pacific Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.

# The Week in the Industry

## Motor Men in New Roles

**BIRDSALL Heads Grossman Detroit Office**—E. T. Birdsall, the well-known mechanical engineer, has been appointed manager of the Detroit office of the Emil Grossman Mfg. Co., Inc., 708 Ford Bldg., to succeed G. E. Shaw. Associated with him are F. G. Walker, M.E., and A. A. Greenburg. They will cover the manufacturing trade. A. L. Glick, who was assistant manager of the Grossman company's Detroit factory before its consolidation with the Brooklyn headquarters at the Bush Terminal, has been appointed sales representative in Michigan, Indiana and Ohio.

**Martin Signal Truck Sales Manager**—The Signal Motor Truck Co., Detroit, Mich., has appointed Joseph J. Martin Western sales manager.

**Merritt King District Manager**—R. P. Merritt has been appointed district sales manager in northwestern Ohio for the King Motor Car Co., Detroit, Mich.

**Darrah Manager**—W. R. Darrah has been appointed sales manager of the E. C. Johnson Co., Philadelphia, Pa., distributer of the Reo and Premier cars.

**Beidler in Charge of Maxwell**—H. Beidler, formerly associated with Don Lee in San Francisco, Cal., will hereafter have charge of the Maxwell interests in the Northwest, with headquarters in Seattle.

**Clement Joins Bock Bearing**—C. H. Clement, until recently chief engineer and sales manager of the Metal Products Co., Detroit, has resigned, and is on the road as sales engineer for the Bock Bearing Co., Toledo, O.

**Castle Representing Flanders Electric**—F. E. Castle has been appointed Michigan representative of the Flanders Electric Co., Inc., Detroit, Mich., and will have his headquarters and salesrooms at 872 Woodward avenue.

**O'Neill Made Secretary**—The Stromberg Motor Devices Co. has transferred W. L. O'Neill from the managership of its Detroit branch to the office of secretary and sales manager of the company, with headquarters at Chicago.

**Van Patten in Advertising Co.**—L. A. Van Patten, who recently gave up the Saxon agency, has gone into the advertising business. He has joined the Cheltenham Advertising Service, 150 Fifth avenue, New York City.

**Seymour Goes to Worcester**—Robert Seymour has been appointed manager of the branch of the White Motor Co., Worcester, Mass., where he will handle cars and trucks under the direction of the New England branch at Boston, Mass.

**Now With the Regal**—Joseph E. Burns, formerly manager of the Lee Motor Car and Supply Co., of New Bedford, Mass., and afterward with the Jackson car in Boston, has joined the Davis Automobile Co. at Providence, R. I., to sell Regal cars.

**White Goes to Chicago**—R. W. White, who has been manager of the Columbus, O., branch of the Goodyear Tire & Rubber Co., has been assigned to manage the Chicago branch. The new Columbus manager is W. W. Magill. The branch is located at 87 North Fourth street.

**Maxwell Sales Manager to Return Home**—C. F. Redden, who has been abroad for several months, has advised the Maxwell Motor Co., Detroit, Mich., that he will sail for America on the steamship "Minnehaha" October 10, arriving in New York about October 19.

**Maurer Studebaker Service Engineer**—E. R. Maurer, M. E., has been appointed service engineer of the Studebaker Corp., Detroit, Mich. He will have charge of all service, parts, orders and claims at the Detroit plants, and also at the various Studebaker branches throughout the country.

**Hogle in Accessory Business**—The Detroit Accesory Co., Detroit, Mich., has started business at 870 Woodward avenue and will handle especially Ford specialties. This is a new company organized recently by W. M. Hogle, who was formerly sales manager of the Republic Motor Truck Co.

**Moore's New G. M. Appointment**—President C. W. Nash, of the General Motors Co., Detroit, Mich., has appointed D. K. Moore, who is sales manager of the Weston-Mott Co., Flint, to be also sales manager of the Northway Motor Mfg. Co., Detroit, and of the Jackson-Church-Wilcox Co., Saginaw, Mich.

**Griffith Promoted**—H. A. Griffith, who for the past 2 years has been assistant manager of the Los Angeles branch of the United States Rubber Co., has been appointed manager of the Spokane branch, to succeed H. A. Thompson, who has been promoted to the management of the Seattle and Tacoma branches.

**Judd Joins Gilmore**—J. L. Judd, until recently sales manager of the Jackson Motor Car Co., Boston, has joined the E. A. Gilmore Co., representing the Lewis VI. The Gilmore company now has practically all the Eastern New England territory for the car, and Mr. Judd will tour New England, establishing new subagents.

**Cappeller North East Electric Manager**—Edward Cappeller has been appointed Detroit, Mich., manager of the service department of the North East Electric Co., Rochester, N. Y., which makes starting and lighting systems. The local headquarters have been opened with the Foster Motor Sales Co., 1751 Woodward avenue.

**de Causse Heads Locomobile Dept.**—The Locomobile Co. of America, New York City, has opened a special department for the planning and ordering of specially designed bodies. J. Frank de Causse will manage this department. He has been connected for the last 10 years with the French automobile body manufacturers, Kellner & ses Fils, as assistant manager.

**Moore's New Hupp Appointment**—Laurence Moore, who has devoted most of his time in promoting the foreign trade end of the business of the Saxon Motor Co., Detroit, Mich., has been appointed director of both domestic and foreign sales. Mr. Moore recently returned from an extensive business trip to Europe. C. F. Jamison, who has been sales manager, will continue in that capacity.

**Poole to Return to Europe**—John L. Poole, export manager of the Hupp Motor Car Co., Detroit, Mich., with headquarters in Paris, will return to Europe from Detroit in the near future for the purpose of looking into Hupmobile business. Mrs. Poole will accompany him. Mr. Poole believes that there will be business for American automobile manufacturers in Europe this autumn.

**New Marmon Branch Managers**—W. F. Siegmund, until recently vice-president of the Electric Garage & Service Co., St. Louis, Mo., has been appointed manager of the Kansas City, Mo., branch of the Nordyke & Marmon Co. A. B. Wagner has been appointed manager of the Indianapolis sales branch of the Nordyke & Marmon Co. He has been employed by the company for the past 6 years.

**Whitehead Norwalk Tire Sales Manager**—J. W. Whitehead, general sales manager of the Diamond Rubber Co., San Francisco, has resigned to join the Norwalk Tire & Rubber Co., which was recently organized in Norwalk, Conn. During eight years Whitehead was assistant to C. E. Mathewson, Pacific representative of the Diamond company, and is now general sales manager and secretary of the Norwalk company.

**Bond Succeeds Root**—G. A. Root, president and general manager of the Crescent Motor Car Co., St. Louis, Mo., has resigned and is succeeded by M. W. Bond of the Bond Automobile Co., retail automobile dealer in St. Louis, Mo. Mr. Bond has also acquired Mr. Root's stock in the Crescent Co. J. B. Howard has been appointed sales manager and the company is arranging to put out a small four-cylinder car listing at $985, fully equipped, including electric starter, etc.

**Petre Consulting Engineer**—L. J. Petre, during many years in charge of the experimental and research departments of the F. B. Stearns Co., Cleveland, O., has gone into business for himself as an expert consulting engineer, and will also organize what might be called a club, consisting of some 300 automobile owners, whose motor cars he will personally inspect at regular intervals. Mr. Petre is temporarily located with the Auto Repair, Storage & Supply Co., Euclid avenue.

**Recent Champion Plug Appointments**—J. T. Moultrup, well known on the Pacific Coast, and lately with John Millen & Sons, Vancouver, B. C., is now representing the Champion Spark Plug Co., Toledo, O., in the Middle West. Charles Corwin, well known to the New York trade, formerly with the Ely company and the Donnelly Motor Equipment Co., is covering the New York territory for the Champion company. E. S. Torrance, for a number of years with Post & Lester and Bi-Motor Equipment Co., Boston, Mass., is covering the Eastern territory for the company.

# Accessories for the Automobilist

**PULL-U-OUT Tackle** — For stalled motorists, for lifting heavy loads, for all purposes where power against weight is needed, the tackle made by the Pull-U-Out Mfg. Co., 909 Pine street, St. Louis, Miss., is specially fitted, multiplying as it does the amount of force placed upon it by seventy. The mechanism of Pull-U-Out consists of a winding drum 6 inches in diameter, carrying 30 feet of quarter-inch steel tiller rope and capable of withstanding a ton pull. Internal gearing in the drum engages a bronze pinion on a long ratchet crank. A steel frame carries the drum and gearing and is provided with hook bolts and a sheave or block.

Two strong chains and three stakes of peculiar manufacture complete the outfit, which retails for $15.

**Dippert Motor Radiator**—A radiator of the Mercedes type is the Dippert, Fig. 1, made by the Motor Radiator Corp., Buffalo, N. Y. It is of the fin and tube type of construction but so made as to be free from the tendency of this type to leaking where the tubes enter the bottom and top headers.

**Oakes Pressed Steel Pulley**—To reduce weight and to make a saving in the cost of manufacture, the Oakes Pressed Steel Co. is placing for sale the Oakes pressed steel belt pulley. In the past it has been impossible to use pressed steel pulleys as there was not stock sufficient to cut a keyway. This has been overcome by brazing in a piece of tubing and cutting the keyway in the tubing. By substituting pressed steel, the weight has not only been greatly reduced, but a saving varying from 6 to 10 cents on each pulley has been made, as no machining is necessary. Being ready to assemble, a saving in time and equipment is also effected.

**Halladay Automobile Bumper**—Made of channel steel and designed for all styles of cars having drop front spring hangers, the L. P. Halladay Co., Streator, Ill., is advancing the Halladay bumper, (Fig. 2) as a money saver in that it reduces the chances of accident to the front of a car, thereby saving its price, $12.00, many times over by protecting lamps, fenders and radiators. In case of a severe shock the channel bar, the only bendable part, may be straightened. The other parts are practically unbreakable.

**Sturges Shock Absorbers for Fords**—A semi-hydraulic shock absorber, particularly adapted to Ford cars is being advanced by the Pacific Leather Works, of Oakland, Cal. It consists of a cylinder containing a spring, which is covered with oil. The springs of the car are suspended from these inner springs of the smoother, the outer arm being rigidly attached to the axle. This Sturges smoother, it is claimed, eliminates all shock and vibration.

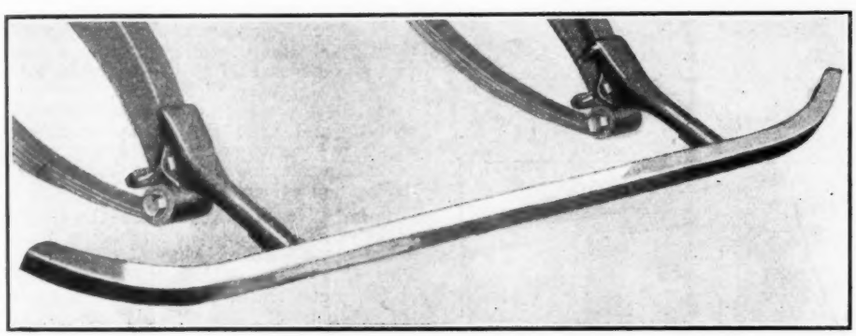

Fig. 2—Halladay steel automobile bumper

**Racine Electric Brass Polisher**—To facilitate the polishing of brass-work on automobiles, the Racine Electric Co., Racine, Wis., is selling the Racine High Speed Auto Brass Polisher. This has a special high speed motor for giving the buffer the proper surface speed. The type G outfit is equipped with a 3½ by ½ grinding wheel, a steel brush wheel for cleaning tires before vulcanizing and two buffs for polishing brass or nickel plate, and has a threaded tapered spindle for attaching the various wheels. All the motors of this company are universal, operating on either alternating or direct current 25-60 cycle, 110-130 volts, with other voltages to order.

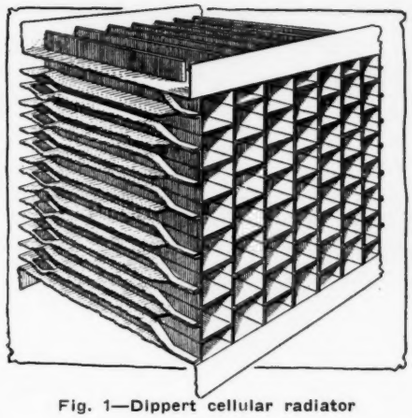

Fig. 1—Dippert cellular radiator

**Walz Auto Signal**—The improved Walz Auto Signal, Fig. 3, for indicating to other motorists which way a car will turn, or if it will stop, is simple in construction. The signal consists of two brackets, each containing two signal disks. One is situated over the number plate and the other on the left front fender. If the driver intends turing to the left, an arrow flashes in the left disks and vice versa. On stopping both appear.

**Sterling Custom-made Tires**—Made to order tires, with the name of the consignee stamped upon them if desired, is the offer of the Rutherford Rubber Co., Rutherford, N. J., makers of the Sterling Tires. These tires run from $8.25 for a 28 by 2½ to $53 for a 37 by 5. They are made in straight-wall and clincher quick detachable types. The Rutherford Rubber Co. is also making the Sterling Realrubber spring bumpers.

**Perkins Anti-Glare Shade**—Preventing the glare from the headlights of an oncoming vehicle from blinding the driver is accomplished in a simple device brought out by Perkins & Co., Grand

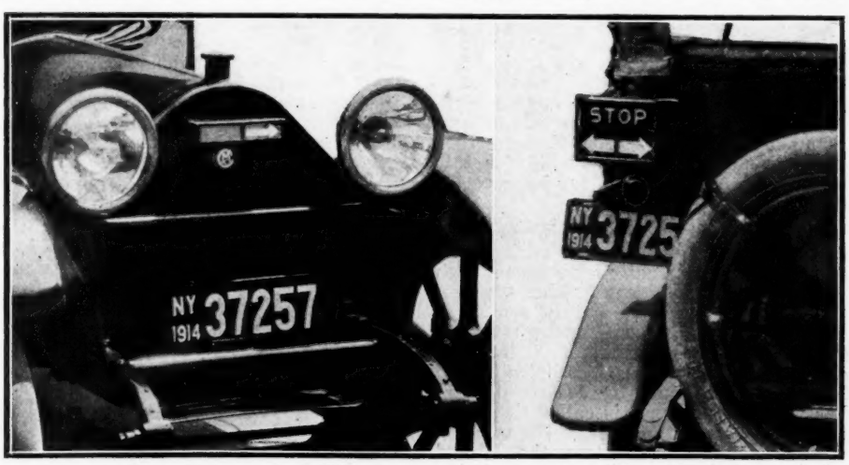


Fig. 3—Walz Auto Signal. It is attached to both front and rear

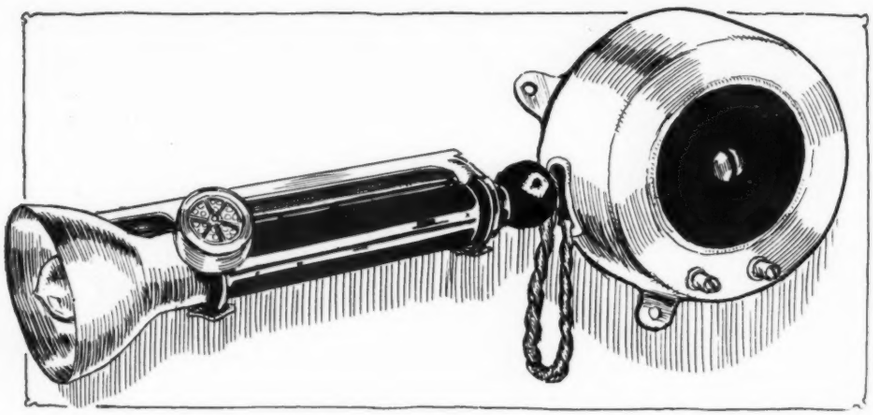

Fig. 4—Automatic cord winder attached to a combination cigar lighter and trouble lamp

Rapids, Mich., and called an anti-glare shade. It consists of a rectangular piece of amber-colored glass, properly supported on a bracket and so positioned that the driver can, by merely moving his head, cause the line of vision to go through the glass. When not needed the driver may look ahead as ordinarily but when glaring headlights appear before him he need do no more than turn his head and look through the amber glass. It is said the shade does not interfere with driving, as one may have unobstructed vision on all sides of the shade and through it without the slightest inconvenience.

**Automatic Cord Winder**—Fig. 4 shows the automatic cord winder manufactured by the Metal Specialties Mfg. Co., 736 W. Monroe street, Chicago, Ill., attached to a combination lamp and cigar lighter. This device holds the flexible cord running to the lamp and whenever the lamp or cigar lighter are to be used, the cord is automatically unwound, but the moment the tension is released the cord is rolled up again. The lamp fits into a simple case that may be attached to any part of the car.

The price of the automatic cord winder alone is $2.50, while combined with the cigar lighter and lamp it sells for $6. The eastern agent is Asch & Company, 1779 Broadway, New York City.

**Allan's Self-Adjusting Wrench**—The harder the pull the tighter the nut is held in the new wrench shown in Fig. 5 and which is manufactured by A. C. Allan, 420 West 63d street, Chicago, Ill. The operation of the wrench is simple in principle. One jaw is slotted and fitted with suitable guides, as shown, to allow the other jaw to slide in it. The handle is pivoted in the larger jaw and when force is applied moves the smaller jaw and thus grasps the nut firmly. The handle is reversible, so that it has the advantages of an ordinary S wrench. The pin that holds the handle is removable for this purpose, being held in place by a cotter pin and a washer.

**New Oil-Pouring Device**—When lubricating oil is poured into the motor compartments there usually is waste through sloppage over the sides of either the funnel or the can used, and it also is a difficult matter in some motors to get just the required amount of oil into the chamber. To obviate this difficulty the No-Shammy Products Co., Cleveland, O., has brought out what is called the Half-and-Half, a rectangular oil container with a spout at the bottom, the flow of oil through the spout being controllable by a thumb lever. This container, which

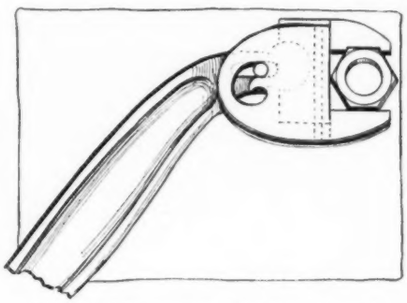

Fig. 5—Allan's self-adjusting wrench

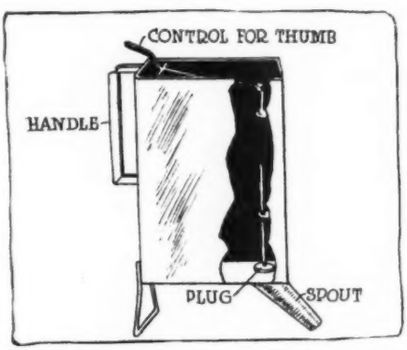


Fig. 6—No-Shammy oil-pouring can

is shown in Fig. 6, has a convenient handle, and the inside opening of the spout is covered with a small cap, which cap is connected by two rods to a thumb lever. Pressure on this lever raises the cap and thus permits oil to flow through the spout. Releasing the thumb pressure plugs the spout and stops the flow of oil. The Half-and-Half is made in two sizes, a quart size which sells for $1 and a two-quart measure which lists at $1.50.

**No-Shammy Waste Can**—A new idea in garage equipment, the providing of a waste can for the placing of old waste, together with a compartment for the holding of clean waste, is being sold by the No-Shammy Products Co., Cleveland, Ohio. The can is manufactured from heavy galvanized iron, and is fitted with a hinged lid at the top. It can be quickly fastened to the garage wall with wood screws. On the front is attached a sponge cup, and beneath is a swinging-rod for the drying of chamois skins. The 5-pound size sells for $3.00 and the 2-pound for $2.00.

**Ogden Ratchet Swivel Joints**—Claiming that breakage and distortion of speedometer shafts, gears, etc., is due largely to strains imposed upon them when the car reverses, the Ogden Fiber Gear & Tire Co., Columbus, O., has brought out a device for eliminating these faults. It is called the Ogden ratchet swivel joint, is illustrated in Fig. 7, and sells for $5. This joint is attached to the end of the speedometer flexible tubing, taking the place of the present joint, and may be used for either the left or the right side. It is fitted with gears giving the desired ratio for new or old Stewart speedometers, but the maker does not state whether it can be used with speedometers other than the Stewart. The gears used in this joint are of the spiral type.

**Dahl Crescent Tube Guard**—To obviate punctures, the Dahl Co., of Philadelphia, Pa., is advancing the Crescent Tube Guard, Fig. 8, a solid band made of the same material as an automobile tread, and which is tucked into the shoe, between the tread and inner tube. Great resiliency is claimed for this cushion, besides its protective qualities. Chafing and pinching are also done away with. It may be attached by anyone in a few minutes and lasts indefinitely.

**Knickerbocker Luncheon Outfit**—For those motorists who enjoy preparing their own meals while on a tour, the Knickerbocker Case Co., Chicago, offers a very compact case which holds sufficient food and utensils for six persons and can be carried in the tonneau back of the front seat.

It can be used as a table when extended, and then the utensil compartments are easily accessible. Many styles of this outfit are marketed, ranging in price from $15 to $75.

**Beard Tire-Saving Jacks**—A simple form of tire-saving jack is being marketed by the Beard Auto Lift Mfg. Co., Pleasant Lake, Ind. It is featured by a metal hook which slips around the bottom of the hub of the wheel and then by pushing down on the control the wheel is raised from the ground. When not required for use it folds up. A set of four sells for $5.

**National Telescope Cylinder Pump**—A tire pressure of 60 pounds may be reached in two minutes with the National Telescope Pump, which is worked by screwing it into the spark plug hole in one of the cylinders, according to the claim of the manufacturers, the National Motor Supply Co., Cleveland, Ohio. Suction from the piston of the cylinder used operates the pump, causing it to suck in and force out air as the engine revolves. This pump sells for $5.50; with a gauge for $6.50.

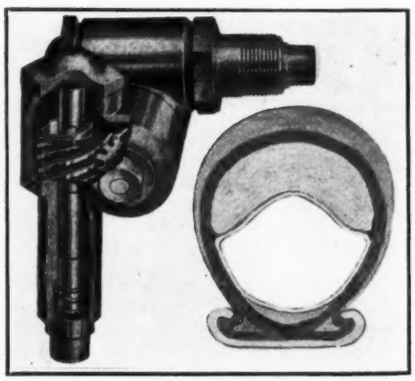

Fig. 7—Left—Ogden ratchet swivel joints
Fig. 8—Right—Dahl crescent tube guard